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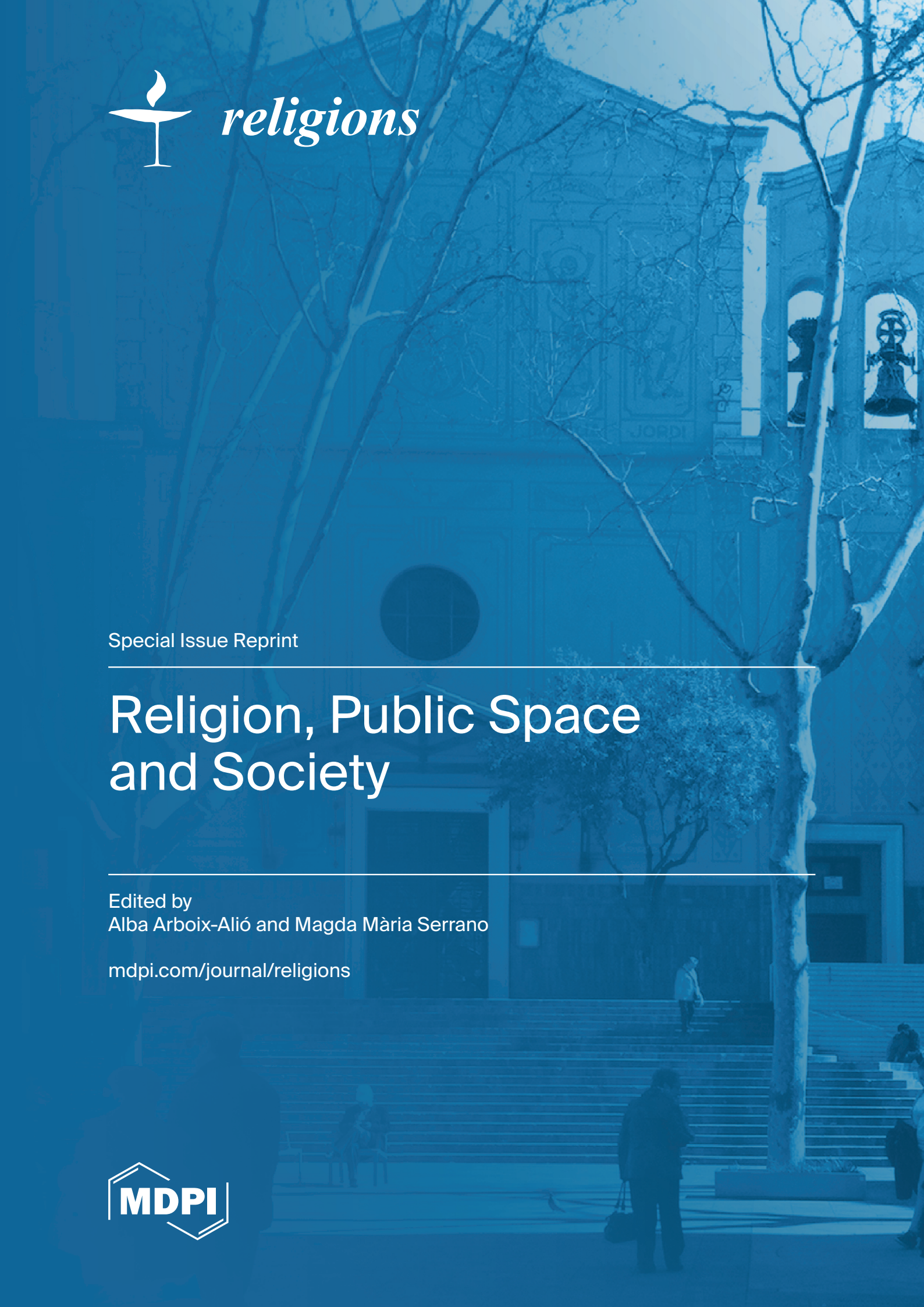

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Religion, Public Space and Society

Edited by
Alba Arboix-Alió and Magda Mària Serrano

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Cover image courtesy of Alba Arboix-Alió

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Editorial

Religious Architecture, Public Space, and Contemporary Society

Alba Arboix-Alió [1,*] and Magda Mària i Serrano [2]

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Public spaces have the capacity to become communal platforms for hosting and celebrating all kinds of religious festivities. This has occurred since time immemorial, reaching its peak during the Baroque period, when ephemeral monuments and temporary structures were built to decorate and temporarily complement liturgical acts. Throughout history, the architecture of the city has often served as a scenographic backdrop for numerous religious events that have enjoyed wide popular participation. Certain streets and historic buildings were adorned with tapestries, banners, and all manner of decorations, becoming the stage for these celebrations. Indeed, the sacred building exerts an influence that extends far beyond the boundaries of its plot. Urban spaces in the city, especially those surrounding temples, have the ability to transform their transient character to become, with greater or lesser means, platforms for socialization and open-air stages for liturgical functions.

In the Western context, however, the advent of modern science, the emergence of autonomous ethical frameworks within religions, and the expansion of non-denominational states have progressively accelerated the secularization of society. This process has led to a decline in Judeo-Christian religious practices and rituals, including within private homes, in the domestic sphere, and in places of worship, in community spaces, and in public squares and streets of towns and cities. This phenomenon, coupled with a decline in religious vocations, among other factors, has resulted in the obsolescence or partial and total abandonment of a significant number of religious buildings and complexes—including churches, chapels, sanctuaries, oratories, convents, and seminaries—as well as the underutilization of their associated intermediate spaces and the deterioration of the public areas surrounding them.

At the same time, paradoxically, a significant segment of society continues to express a need for alternative or complementary spiritual practices beyond those rooted in Christianity. These include meditation, yoga, Zen, Reiki, and other Eastern therapies or traditions associated with different religions. Individual introspection, contemplation, contact with nature, and communal gatherings—whether through regular meetings or spiritual retreats aimed at fostering inner reflection, silence, care, or transcendence—demonstrate that, despite the prevailing culture of materialism and relativism, there remains an enduring impulse to seek some notion of ultimate reality.

Currently, as we approach the end of the first quarter of the 21st century, we face the challenge of redefining a portion of religious architecture that has been abandoned, rendered obsolete, or fallen into disuse. The same has occurred with the surrounding public space—streets and squares—whose dynamism largely depends on the intensity of the activity taking place within this sacred heritage. This process involves recontextu-

alizing these spaces in relation to contemporary cultural concerns, the needs of diverse communities, and the various expressions of spirituality emerging in today's society.

In general, these architectural complexes and buildings, along with the public spaces surrounding them, form part of historic urban fabrics of great heritage value, and are located in privileged areas of cities. Their majestic spatiality, noble materials, and exceptional environmental conditions make them identity-defining places for the citizenry (Arboix-Alió et al. 2023). As such, they are well-suited to once again accommodate a range of functions, rituals, and activities that, in the contemporary world, require spaces for collective gathering, harmony, and connection with culture and transcendence, but also for retreat, silence, and contemplation.

The aim of this Special Issue is precisely to present examples from all periods—from the most recent years of the 21st century to those from earlier eras—that demonstrate the presence of religion in the public spaces of towns and cities, forming a perfect interplay between urban architecture as scenography, public space as a stage, the ritual of liturgical celebration as a narrative script, and society and citizens as a co-participating audience.

This objective is achieved through the selection of nine original articles from diverse geographical and thematic backgrounds, offering valuable insights into the complexity of this phenomenon. Through case studies, these contributions not only propose strategic solutions for preserving and reactivating these exceptional spaces and their surroundings, but also deepen our understanding of the historical, cultural, and symbolic significance of religious buildings and complexes, and their contributions to the identity and cohesion of urban societies.

The case studies presented in this collection of articles are situated in communities with a Catholic tradition across different continents. Covering locations in Ethiopia, the Philippines, Portugal, Venezuela, Massachusetts, France, and Spain—along with articles focusing on cities such as Barcelona, Madrid, and Tortosa, among others—these contributions seek to explore the intricate connections between religion, public space, and society. Together, they aim to provide meaningful insights and serve as valuable references for shaping the future of religious architecture in contemporary cities.

Firstly, a highly relevant issue today is the adaptive reuse of religious buildings that have experienced a decline in the frequency and intensity of their primary function. This challenge is addressed by Eduardo Delgado Orusco in "Wake up cities! A heritage rebalancing plan from the sacred", which proposes a heritage rebalancing strategy for the repurposing of disused historic temples, advocating their transformation into cultural and educational centers (Delgado, 2025). This strategic plan not only safeguards the historical and artistic value of these buildings, but also meets the contemporary needs of modern urban communities. The concept of rebalancing heritage and urban resources aligns with sustainable development policies and urban revitalization strategies.

These strategies began to take shape in the mid-1960s in the United Kingdom, as growing awareness of the value of historic buildings led to a recognition of the need to find alternative uses for them rather than resorting to their demolition. This approach not only preserved architectural heritage, but also integrated these structures into broader urban redevelopment processes.

> "The overall quality of the urban environment depends more on the maintenance and improvement of existing buildings than on the quality of newly constructed ones". (Stone 1971)

Nevertheless, the article also highlights the need to balance this transformation and the repurposing of an excessive number of religious buildings in historic city centers by constructing new churches or multireligious centers in newly developed neighborhoods, which often lack dedicated spaces for meditation or worship.

Another case that directly concerns public space examines how to accommodate large crowds during major religious events. José Antonio Ramos Abengózar, Ignacio Vicens y Hualde, and Jaime Ramos Alderete present "Ephemeral Religious Architecture: The Visits of the Pope to Madrid" (Ramos, Vicens y Hualde, Ramos, 2025). In this study, the authors explore how public space can be temporarily adapted for large-scale religious gatherings through the design of ephemeral architectures that transform urban environments into sacred spaces. This research is particularly relevant in a world where large religious events require flexible and adaptable architectural solutions, demonstrating the ability of architecture to respond to temporary needs while preserving its symbolic significance.

It is relevant to recall here that Alison and Peter Smithson defined three characteristics of public spaces that are closely linked to the associative needs of citizens: permanence, periodicity, and the ephemeral (Avermaete and Ockman 2005). The first two must occur regularly to enhance daily life in society, while the third—which is addressed in this chapter—takes place sporadically to accommodate an extraordinary event.

A similar situation to the one described in the article occurred in Barcelona during the XXXV International Eucharistic Congress of 1952. Public spaces such as squares, streets, and avenues were used for celebrations, gatherings, conclaves, concerts, exhibitions, and performances, alongside existing architectural structures. Thousands of citizens congregated in locations such as Plaça de la Catedral, Passeig de Sant Joan, and Avinguda de Maria Cristina. Additionally, major venues including the Oval Hall of the Palau Nacional in Montjuïc, the Olympic Stadium, the Palau de la Música, and the Auditorium of the University hosted numerous events (Muñoz et al. 2002).

In some cities, due to their temperate climate, cultural traditions, or the natural disasters they have faced, religious worship already takes place directly in open-air settings, either with the aid of small ephemeral structures, or even without them. This phenomenon is explored by Esteban Fernández-Cobián in "Philippines: Open Spaces for Catholic Worship" (Fernández-Cobián, 2025). This study provides a typological cartography of these spaces, highlighting the significance of temporality and the physical connection between interior and exterior in the religious architecture of the country.

The architect Bernard Rudofsky argues that nations historically marginalized by poverty make exceptional use of their city streets. These spaces are experienced as three-dimensional volumes, inseparable from their environment, rather than merely perceived as two-dimensional areas (Rudofsky 1969). In these countries, the street serves as the grand theater of the world that is also capable of accommodating the community's religious rituals—blessings, processions, public prayers, funerals, festivals, and patron saint celebrations are deeply embedded in the collective imagination and have been present in the urban landscape for centuries.

Other articles in this compilation look back to historical examples to recover certain historical and social aspects and explain how architecture ultimately reflects the religious spirit of each era.

Notable contributions in this regard come from Ricardo Gomez-Val, Iñigo Ugalde Blázquez, Cinta Lluís-Teruel, Pilar Morán García, and Bar Kribus. On one hand, the examples of renowned architect Josep Lluís Sert, discussed in the article "The Sacred Architecture of Josep Lluís Sert: Modernity and Tradition in Times of the Second Vatican Council" (Ugalde-Blázquez et al., 2025), illustrate how the profound changes brought about by the Second Vatican Council served as a challenge and an opportunity to design remarkable religious buildings.

Given the shift toward vernacular languages, the repositioning of the officiant to face the congregation, and the desire to involve the entire community, Sert grasped these changes and skillfully fused modernity with tradition. This article highlights the impor-

tance of understanding historical and liturgical contexts in architectural design and reveals a previously underexplored connection between Sert and religious architecture, which is brought to light here for the first time.

On the other hand, "The Apse of the Gothic Cathedral of Tortosa versus Saint Augustine's Civitatis Dei" (Lluís-Teruel et al., 2024) delves into the influence of Saint Augustine on the construction of the Gothic cathedral of Tortosa, uncovering insights made possible using advanced technologies. Through spatial analysis using laser scanning and correlations with patristic and Neoplatonic sources, the study reveals the complex interplay between Gothic architecture and Saint Augustine's seminal work.

Finally, in "A Re-Examination of the Sources of Inspiration of Ethiopian Concentric Prayer Houses: Tracing an Architectural Concept from the Roman and Byzantine East to Islamic and Crusader Jerusalem to Solomonic Ethiopia", Kribus offers a novel historical perspective on how influences from the Roman and Byzantine East, as well as from Islamic and Crusader Jerusalem, helped shape religious architecture in Ethiopia (Kribus, 2024). This study not only enriches our understanding of Ethiopia's architectural history, but also highlights the cultural and religious interconnectedness between the East and West across the centuries.

In a similar vein, though shifting back to a more urban scale, several articles examine the importance of temples, both for their intrinsic symbolism and their role as mediators between public space and the community.

The article "Question and Symbol: Challenges for a Contemporary Bell Tower" by Pablo Ramos Alderete, Felipe Samarán Saló, and Ana Isabel Santolaria Castellanos explores the significance of bell towers in the contemporary context. Through an academic workshop with architecture students, the article examines how these traditional symbols can be adapted to modern challenges, integrating with the urban environment while responding to contemporary demands (Ramos et al., 2025).

Continuing this larger scale, the article "The Sacred Building and the City: Decoding the Formal Interface Between Public Space and Community" by João Silva Leite, Sérgio Fernandes, and Carlos Dias Coelho compares the formal architectural characteristics of temples and their integration into the urban design of Lisbon. The study offers valuable lessons for creating public spaces that enrich the urban fabric and foster community cohesion (Silva et al., 2024).

The final article concludes the collection by once again emphasizing the liturgical recontextualization mentioned at the beginning of this editorial. Using the case study of the multifaith room designed for the Sant Joan de Déu Pediatric Cancer Center, which serves patients and families from around the world, the article brings to the forefront the debate on the need for spaces that enable transcendent practices without being tied to any specific religion—yet accommodating all at once.

In "Multifaith Room for the Pediatric Cancer Center of Barcelona—An Intrahospital Public Space in the City," Alba Arboix-Alió and Oriol Ventura Rodà reflect on the importance of such spaces, which allow for isolation, meditation, silence, or prayer—needs that are essential in public buildings in general, and especially critical in a children's hospital (Arboix-Alió & Ventura, 2024).

In conclusion, this Special Issue has successfully achieved its objective of presenting examples from various historical periods and locations where the presence of religion in the public spaces of cities is evident. It also addresses the challenges of managing underutilized or abandoned religious heritage and reflects on the paradigm shift currently taking place in spiritual practices, particularly in the Western world. When considered as a whole, and despite the different approaches taken, all the contributions reveal a clear connection

between existing religious architecture, urban public space, and society's spiritual habits embracing the triad that gives this collection its title: Religion, Public Space, and Society.

Louis I. Kahn stated that "a city is measured by the character of its institutions. The street is one of its first institutions." The church is as well. He further observed: "Today, these institutions are being questioned. I believe this is because they have lost the inspirations that originally motivated their creation" (Norberg-Schulz and Digerud 1981).

If, as Kahn suggests, the street and the church are once again to become social and civic institutions, faithful to their origins, both must be capable of acting in coordination, offering architectural platforms for communal use. They should also be able to exchange functions, allowing the physical and ideological boundaries that have developed between them over recent decades to regain their permeability, ensuring mutual enrichment for the benefit of both the ecclesia and the city, along with its citizens.

We extend our sincere thanks to all the authors, reviewers, and editors who contributed to this Special Issue. Their dedication, expertise, and thoughtful insights have been essential in enriching this collection and advancing the dialog on the relationship between religion, public space, and contemporary society.

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Arboix-Alió, Alba, and Oriol Ventura Rodà. 2024. Multifaith Room for Pediatric Cancer Center of Barcelona—An Intrahospital Public Space in the City. *Religions* 15: 922. https://doi.org/10.3390/rel15080922.

Delgado-Orusco, Eduardo. 2025. Wake Up Cities! A Heritage Rebalancing Plan from the Sacred. *Religions* 16: 277. https://doi.org/10.3390/rel16030277.

Fernández-Cobián, Esteban. 2025. The Philippines: Open Spaces for Catholic Worship. *Religions* 16: 138. https://doi.org/10.3390/rel16020138.

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Article

Wake Up Cities! A Heritage Rebalancing Plan from the Sacred

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Abstract: This article outlines our plan to rebalance the patrimonial heritage from the sacred: a strategy of attention to the needs and social demands, both religious—primarily—and other kinds, of the inhabitants of these communities. Our plan provides an attentive and unprejudiced view of service that proposes new uses for structures of great patrimonial and sentimental value. These are complexes recognized by societies but incapable of being maintained without intervention, given that their use has greatly diminished in today's society. All this must be considered while additional legitimate demands have arisen that do not find an adequate response in the same community. It is not a matter of competition but of an effective adaptation or a rebalancing through the reprogramming of some properties. We cannot forget that non-religious cultural and social demands also apply to the faithful. Being a believer does not exclude one from being a lover of music or museums.

Keywords: patrimonial heritage; strategic action; rebalance; sacred

1. Introduction

In our cultural environment, previous generations have bequeathed to us a multitude of places of worship. These include cathedrals, parishes, oratories, chapels, even synagogues and mosques, in city centers and other geographical areas. This presence is denser the older the community considered, and this typology also serves to outline the history of art in each place.

As is natural, this heritage endowment requires a duty of care and conservation that, in general, exceeds the economic possibilities of the communities it serves. They must resort to subsidies and other forms of municipal, regional, national, or international aid—public or private—whose management must be based on real operational possibilities.

On the other hand, modern societies have mostly emancipated themselves from religious practices, replacing them with activities linked to the passing of time, be they cultural—museums, concert halls, exhibition halls, recreational areas, etc.—commercial, or sporting. Regardless of the possible social assessment of this transformation, facilities with a religious origin have been notably emptied and, in any case, compete for an increasingly diminished attendance.

In the Spanish context, Professor Paloma Gil recently explained this phenomenon as a particular episode in the wider context of building reprogramming:

> *Let's also think of churches, which once deconsecrated become cellars for the silent aging of wine; also auditoriums, bookstores, bars and restaurants or even car repair shops. In Toledo, the old temple of San Vicente, founded by Alfonso VI, has been a museum, a warehouse, a classroom for the University and is now a Fine Arts Circle at the service of "artistic expression, cultural promotion, nightly celebrations and the exercise of free*

thought". The School of Architecture of Granada occupies a former convent, thanks to the inspired project of Víctor López Cotelo, and what was once the church of the Escuelas Pías in the Madrid neighborhood of Lavapiés is now a university library designed by José Ignacio Linazasoro. (Gil 2020) (Figures 1 and 2).

Figure 1. Transformation of the former church of the Escuelas Pías into a library and cultural center in Lavapiés (Madrid). Architect, José Ignacio Linazasoro. Photographer, Miguel de Guzmán.

Figure 2. Transformation of the former church of the Escuelas Pías into a library and cultural center in Lavapiés (Madrid). Architect, José Ignacio Linazasoro.

On the other hand, in the newly created neighborhoods of our cities, the religious presence is scarcely available for the average religious practices of their inhabitants, regardless of their religious affiliation. This is the result of planning that is geographically

extensive; vocationally peripheral; dedicated almost exclusively to the residential fabric; and designed in many cases to be traversed with motor vehicles, whether public or, more often than not, private. This arrangement threatens the religious endowments, considered by many as the most dispensable of them all, independent of the historical programs that for centuries were familiar to them: education and health care. The architect Rafael Moneo accurately explained this phenomenon of the formation of neighborhoods without facilities in a suburb of Madrid:

> *Chemists know that to start a crystallization process it is necessary the appearance of a small foreign being or a crystallized particle.*
>
> *It could be asked if the new urban centers need, as a "condition without which they cannot", that center, that core, around which the houses have a sense that we miss today; it is sad to see how our houses are today authentic dormitories that have lost much of what constituted their raison d'être: the contribution to the urban form.* (Moneo 1961)

Under these conditions, a strategic plan can be drawn up to address this double problem: on the one hand, the saturation of religious buildings in the center—or centers—of historic cities and, on the other, the scarcity of resources needed for religious facilities in the peripheries. The idea is to propose an intelligent exchange of buildings, plots, and resources; in many cases, the places of worship in the city centers—once decommissioned into cultural facilities such as auditoriums and concert halls, libraries, and small museums—or even educational and commercial centers are in excellent condition to be transformed, with due respect for the collective memory and the origin of the buildings.

The starting point is a new mapping of religious centers that, for corresponding reasons—pastoral, traditional, strategic, etc.—are deemed appropriate to preserve. This study should be conducted realistically and carefully to free up other facilities that can be used for cultural or other purposes. This is key to the success of the proposed plan. There is no doubt that all the properties likely to be affected by this approach will have their own history and weight in the collective memory of the community. Without forgetting the importance of this dimension, what is at issue here is to reserve for religious use a network of centers in such a way as to condense the whole. This will mean that some places of worship fulfilling this original function should be reconverted, overcoming a nostalgia that is not sustained in the current social reality.

In exchange for these valuable properties, the different governmental bodies can offer concrete aid to the suburbs or other locations that require it, whether economic or in the form of exchange of land or other assets. This policy, which would involve religious, cultural, political, and social agents, as well as those who provide a solution for the rebalancing of real estate in the cities as a whole, will result in a more balanced network of pastoral care than what is currently found and is the result of non-planning inherited from the past, without any other criteria.

This article outlines a plan to rebalance the patrimonial heritage from the sacred. As mentioned above, it is a strategic action of attending to the needs and social demands, both religious—certainly in the first place—and other kinds, of the inhabitants of these communities. This plan is an attentive and unprejudiced view of service, offering new uses to structures of great patrimonial and sentimental value. These would be complexes recognized by their communities but incapable of being maintained without intervention, given that their use has been greatly diminished in today's society. This change has occurred while new legitimate demands have arisen without receiving an adequate response from that same community. It is not a matter of competition but of an effective adaptation or a rebalancing action derived from the reprogramming of some properties. We cannot forget that non-religious cultural or social demands also affect the faithful. Being a believer does not exclude one from being a lover of music or museums (Figure 3).

Figure 3. Transformation of the former Hospital de la Encarnación of Granada into the School of Architecture of the University of Granada. Architect, Víctor López Cotelo. Photographer, Fernando de Alda.

2. Scientific and Normative Context

As early as 1989, the Parliamentary Assembly of the Council of Europe had already drawn attention to the vulnerability of religious cultural heritage, owing to its redundancy in a territory, whether urban or not. In its resolution n. 916, the organization provided the following warning:

> *When a religious building is no longer viable as such, effort should made to ensure a future use, whether religious or cultural, as far as possible compatible with the original intention of its construction* [7] *and that local communities are the subject needing to be encouraged "to rediscover a shared interest and a future role for such buildings"* [8]. (Council of Europe 1989)

In 2003, the International Center for the Study of the Conservation and Restoration of Cultural Property [ICCROM][1] promoted the *Conservation of Living Religious Heritage*, where, faced with the possible use of religious heritage as a hostage in conflicts of war or its abuse or abandonment, the scientific community established the criteria of shared responsibility between religious communities and heritage conservation professionals. The contents of this meeting were an appeal to the possible conflict between the vitality of religious communities—promoters and true protagonists of this heritage—and the duty to maintain this same heritage:

> *The care of this heritage is primarily the responsibility of the religious community for whom this heritage has importance, at local and/or global levels. The conservation of living religious heritage is ideally initiated by the religious community and carried out in collaboration with conservation professionals and all those concerned.* (Stanley-Price et al. 2005)

Since then, the leading role of the believer communities in the conservation of religious heritage has been ratified in practically all the meetings and scientific declarations dedicated to this subject. In this regard, the *Framework Convention on the Value of Cultural Heritage for Society* celebrated in Faro (Council of Europe 2005), the Xi'an *Declaration on the Conservation*

of the Setting of Heritage Structures, Sites and Areas (ICOMOS 2005), and the *Québec Declaration on the Preservation of the Spirit of the Place* (ICOMOS 2008), the latter two promoted by the International Council on Monuments and Sites, ICOMOS,[2] are worth mentioning.

So, by the setting, the Xi'an Declaration means the "past or present social or spiritual practices, customs, traditional knowledge, use or activities and other forms of intangible cultural heritage aspects that created and form the space as well as the current and dynamic cultural, social and economic context" [1]; the document concludes with the following reminder: *"Awareness of the significance of the setting in its various dimensions is the shared responsibility of professionals, institutions, associated and local communities, who should take into account the tangible and intangible dimensions of settings when making decisions* [13]*"* (ICOMOS 2005).

The *Burra Charter* focuses on the cultural significance of heritage, stressing that its valuation implies a complex process in relation to compatible uses and participation [6, 7, 12 and 14], where the following can be highlighted: *"Change may be necessary to retain cultural significance, but is undesirable where it reduces cultural significance of the place and its appropriate interpretation* [15.1]*"* (ICOMOS 2013).

Finally, in this list of declarations and documents, it is worth mentioning the *Statement on the Protection of Religious Properties within the Framework of the World Heritage Convention* celebrated in Kiev (UNESCO 2010). This document was considered at the 35th session of the World Heritage Committee [Paris, 2011], and the theme recurred in discussions at the 36th [St. Petersburg, 2012] and 37th sessions [Phnom Penh, 2013], in anticipation of the collaboration between the World Heritage Centre and ICOMOS, ICCROM, and IUCN [Steering Group on Heritage of Religious Interest].

On 7 March 2017, the ICOMOS Scientific Committee for Places of Religion and Ritual [PRERICO] was formally established, initiating the collaboration with the UNESCO Steering Group on the occasion of the 41st session [Krakow, 2017]. An immediate consequence of the above was the *Davos Declaration Towards a High-Quality* Baukultur *for Europe*, arising from the Conference of European Ministers of Culture (2018).

In response to the abovementioned problem and in light of the different approaches taken by the scientific community and international chapters linked to heritage, from the Catholic Church—through the Pontifical Council for Culture, the equivalent of the Ministry of Culture of the Vatican State—an international scientific meeting was promoted, together with the Italian Episcopal Conference, to study this phenomenon. The congress took place at the Gregorian University in Rome on 28–29 November 2018 and brought together mainly European experts who presented different case studies. Specifically, cases were presented from Spain, Portugal, Australia, Austria, Belgium, Canada, England and Wales, Lithuania, Poland, Czech Republic, Romania, Serbia, Slovenia, Switzerland, Turkey, Hungary, France, Slovakia, Germany, the United States and, of course, Italy. Some of the interventions were similar to the plan presented in this article and can be considered precedents, with different approaches and nuances (Radice 2019; Meynier Philip 2019; Pozzobon et al. 2019; Erdélyi 2019). However, what was fundamental in this meeting were the necessary discussions of a doctrinal nature elaborating on some first Vatican guidelines for the reuse of places of worship. These guidelines were published almost immediately—on 17 December of the same year—before the publication of the proceedings of the congress (Capanni 2019). They were presented by Cardinal Gianfranco Rabasi, current president of the Pontifical Commission for Sacred Archaeology since September 2007, who was president of the Pontifical Council for Culture from 2007 to 2022 and president of the Pontifical Commission for the Cultural Heritage of the Church from 2007 to 2012. His participation in the establishment of the guidelines and his trajectory in the cultural field endowed this first Vatican document dedicated to conservation with undoubted prestige.

Before unpacking its contents, it is useful to understand the objective of these guidelines, which, while important, is also limited. The fundamental objective of the document is to shed light on the process of decommissioning immovable goods that at some point have ceased to be sacred and consequently returned to their profane condition. This is, as Mircea Elíade explains, the transition from having been separated from the world and dedicated to divine worship, to losing that condition and returning to the world of the common (Eliade 1961). It is reasonable that prudential measures should be taken to ensure that, in this transition, there are no abuses or neglect. The issue is important precisely because there are transcendental values at stake, regardless of the degree of belief of each person.

Naturally, these guidelines do not describe a scenario of possible convenience or of social, urban, or strategic interests. This reality is within reason. In fact, the Church, although attentive to the development of the societies in which it is established, ordinarily refrains from intervening directly in matters of a secular nature, such as urban policy or the business of secular real estate planning. It can offer suggestions that highlight its message, but it cannot impose subjective criteria on what is legitimately debatable.

In this sense, the Vatican guidelines evoke previous documents, such as those already mentioned, and others at the local level with a similar intention. In particular, it recalls the *Charter on the Use of Former Sacred Buildings*, published in 1987 by the Central Pontifical Commission for Sacred Art in Italy, which offered an initial approach to the decommission of places of worship in Italy, understood as a laboratory for experimentation.

The same document mentions similar publications by the Episcopal conferences of Germany [2000], Switzerland [2006], Belgium [2012], and England and Wales [2018], contributing to a chronology of the progress of this phenomenon and of the sensitivity of their hierarchies.

In any case, it is welcome to see that the Church's attention to this reality is expressed through the renewed vision of the pontificate of Pope Francis. Specifically, the document quotes the following: *"the renewal of structures demanded by pastoral conversion can only be understood in this light: as part of an effort to make them more mission-oriented"* (Francis 2013). Here, it is possible to identify a deepening of the Church's ultimate goals rather than a vindication of its inherited patrimony.

The document proceeds to express some reasonable general considerations related to the process of reducing a church to profane use. In particular, it posits the following, which outline the main concerns of the Church in relation to this issue:

> *(i) the need to preserve from improper (sordid)*[3] *use those former churches that have already been reduced to a profane use in their passing from one owner to another;*
>
> *(ii) the need to avoid situations that can give offence to the religious sentiments of a Christian people;*
>
> *(iii) the need to consider the destination of altars, which can never lose their dedication or blessing even after a church has been reduced to a profane use. Concerning altars, the canonical practice of destroying the table in some cases can find itself in clear opposition to civil norms concerning the conservation of cultural heritage.* (Pontifical Council for Culture 2018)

On the question of the altars and other elements, which, due to their critical condition, cannot be desacralized and may seem doomed to destruction, they are addressed by the plan we are presenting here. Given that what drives this initiative is a rebalancing, that is, the decongestion of the centers and the endowment of the peripheries, the transfer of these critical elements to the new facilities can be considered. This offers not only protection for

these elements but also a foundational artifact endowed with tremendous symbolism for the new parishes because of its relationship with previous generations of believers.

In any case, in light of the objectives of our plan, the most interesting aspect of the guidelines is contained in the final recommendations approved by the Pontifical Council for Culture itself, as well as by the delegates of the Episcopal Conferences of Europe, Canada, the United States, and Australia. The recommendations range from the reminder of the responsibility of the communities—particularly the religious communities—in the care of the heritage [1 and 5], to the necessary training of those responsible[4] [2], to the importance of having inventories of religious properties, whether movable or immovable [3], in the declaration of objects of possible alienation [5], in advising on the future uses of decommissioned churches [6], or in advocating prudent transformations with a view to their reversibility [8 and 9]. For our project, however, the most interesting statement is number [4]:

> *Every decision about cultural heritage must be part of a coordinated territorial vision that includes social dynamics (demographic change, cultural politics, labor markets, attention to environmentals and countryside sustainability, etc.), pastoral strategies and conservation needs in agreement with international and national norms regarding cultural heritage, with the planning for the use of ecclesiastical buildings over at least a medium term scale. In this context it will be essential for the ecclesial community to engage with the civil community in the region, which should be disposed to give the heritage a wider use. The process discerning the future use of a decommissioned church must involve heritage conservation specialists, architects and surveyors, together with the parish and the wider community having an interest in the building.* (Pontifical Council for Culture 2018)

Implied here are the intelligence and openness of the Church in recognizing values that exceed the merely patrimonial in the management of its properties. It may be said that this recommendation is the basis for our plan to rebalance our heritage from the sacred (Figure 4).

Figure 4. Transformation of the old church of San Vicente, founded by Alfonso VI, into the Círculo de Arte de Toledo.

3. Principles of Action

In order to support what follows, it is necessary to comment on the very nature, not of the built heritage, but of the built settlement, whether urban or not. It is clear that each one of us has a memory related to our experience and to the time in which we have lived. However, we must also understand that the existence of towns and cities can be measured in centuries or millennia, and they are in constant evolution. In fact, human settlements are a reflection of the societies that build them, and, consequently, they have some moments of brilliance and growth and others of decadence and possible recession, and may even be abandoned.

With this principle in mind, I introduce the concept of *palimpsest* applied to the conformation of those social fabrics we are considering. Here, I confess my debt to Professor Francisco Javier Sáenz de Oiza (Cáseda, Navarra, 12 October 1918, Madrid, 18 July 2000) whose teaching extended to my first years as a student at the Madrid School of Architecture in the eighties. In the dense and highly cultured prose on the meaning of architectural projects that characterized his teaching, this great architect cited the idea of *palimpsest* to explain the nature of cities and even of buildings, thus anticipating a much more contemporary sensibility. This brief introduction and recognition serve as a heartfelt tribute to one of the founders of modern architecture in Spain and of teaching as we understand it today.

The idea of *palimpsest* derives from the tablets used in ancient times, particularly in commerce, whose dynamics invited a continuous exchange of information. This information was written on those tablets which, once used, were erased and rewritten, updating the information or providing new data. That is to say that the tablet was understood as a permanent support, while the writings maintained a more ephemeral, less stable condition.

This image can help us to understand the condition of humanity and its earthly constructions. Thus, we can consider that the earth as a whole is a great tablet on which to write—on which to order the territory, urbanize cities, or construct buildings—but that these actions are ephemeral, measured in terms of the societies that develop them.

In fact, something of these actions, of these traces, can survive even over millennia despite the disappearance of the territory, the cities, or the buildings, offering clues about the use of the place and its *genius loci*.

These traces are analogous to the remains of writing on ancient tablets. These same traces will help us to configure the traces of the place or even the remains of the buildings, whether they are in ruins or intact but in disuse or decay. Thus, the abandonment of a certain use can be understood as an invitation to adapt the buildings to a new use, thus instituting a use more in line with the limitations of the resources, including the materials, energies, and soil.

The awareness of the limitation of resources—in terms of materials and energy, but also in terms of land availability—has led to a rationalization of their use. This logic also enhances the appreciation of the heritage by successive generations and allows for a more intelligent and sensitive dialogue with our own history.

Thus, understanding the territory, the city, and the buildings as a *palimpsest*, a support on which our becoming takes place, but which inescapably preserves traces of previous generations, generates the idea of transformations on the earth as a synchronic activity, that is to say, having a discursive relationship in time. There is something especially beautiful in understanding our constructive actions as a contribution to the chorus of voices throughout history. We can understand the continuity which, in the case of cities in particular, allows us to use the same name for realities over the great passage of time. Let us think of the first groupings of dwellings that were considered a city and were given a specific name, and of their growth over the centuries—if not millennia—until they became a modern city.

Only the underlying topography—and sometimes not even that—such as a crossroads of latitude and longitude and a name, perhaps updated or adapted in accordance with the evolution of languages, are preserved.

This awareness of continuity is much more profound than the stylistic or technical features, and this sense of twinning with the builders who preceded us should encourage a more sensitive reaction to the environment, more dialogue and less imposition, where the idea of "urbanity", of contribution to a whole that unfolds over time, should preside over all our actions.

If this way of working were fulfilled, we could consider that architecture, understood as a personalistic, autonomous, and self-absorbed discipline, would cease to exist, recovering its sense of service in search of *"a pleasant environment, a generalized well-being, a natural logic, a harmonious order, although all of it impregnated with spontaneity and freshness"* (López Cotelo 1986).

The aspiration of this activity—which we call *meta architecture*[5], that is, beyond architecture—would serve as a vital support to society, including the contributions of our predecessors.

We can realize an exciting scenario in which different constructions find their places next to each other, and the patina of time can suggest the antiquity of some of them.

The coherence of the buildings thus conceived and the respect of some for their neighbors can promote not only the magnificence of each one but also their enhancement of the others.

There is no doubt that this ensemble—these ensembles—will be understood and recognized by society as a fair expression of its values, personally and collectively (Figures 5 and 6).

Figure 5. Transformation of the former Monastery of San Benito into the Patio Herriano Museum of Modern Art in Valladolid. Architect, Juan Carlos Arnuncio.

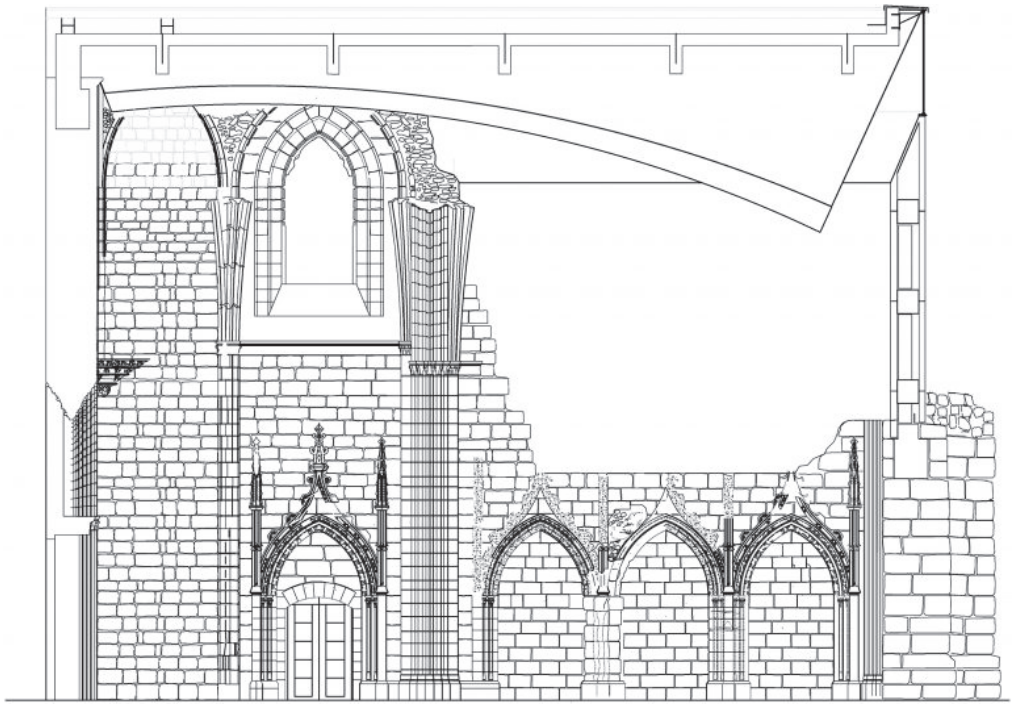

Figure 6. Transformation of the former Monastery of San Benito into the Patio Herriano Museum of Modern Art in Valladolid. Architect, Juan Carlos Arnuncio.

4. Background and Current State of the Question

Returning to the sphere of religious buildings, as already noted in the summary, there are many examples of the transformation of places of worship and other buildings with heritage value for their reuse, but comprehensive policies in this sense are scarce. Proposing them requires a certain reconsideration of the ultimate objectives of religions, which, it seems, should be primarily concerned with the care of their faithful and their needs and only secondarily with their common heritage. Although we believe that this consideration is primary in the hierarchies in charge of the care of the faithful, its ultimate outcomes, which this project aims to define, are more diffuse and difficult to approach. There are many difficulties. In fact, a policy of *renouncing* some of the patrimonial treasures inherited by the different communities, as civil institutions, could be interpreted as a cession in the face of the current pressure. These considerations exceed the focus of this text, since they should be resolved before undertaking any change. It is a matter of achieving the greater good, such as the best possible pastoral care for the greatest number of the faithful, in the center and particularly on the peripheries. In fact, a successful policy of transformation can serve to reiterate, at least contextually, the heritage elements linked to the faith, even if the buildings have changed their use.

In any case, and with regard to precedents, we should study specific examples where the process of decommission and transformation of use has taken place. These cases are becoming more and more frequent, and the greater or lesser success of the process must be determined in order to draw useful conclusions for the proposed process. To this end, a bibliographic documentary and operative sweep of valid examples are essential.

A field study of those territories where religions have had a significant presence, resulting in the density of places of worship and other religious endowments, is key to implementing this project. Art history texts can be consulted for each settlement to identify the heritage buildings that are the first object of this project.

It is also convenient that the conditions of growth of the peripheries are present, which will justify the implementation of the described policies, due to the possible neglect of the communities that inhabit them.

As for methodological principles, the (Habitar Research Group n.d.), directed by Professor Xavier Monteys at the Universitat Politècnica de Catalunya (UPC), although focused on the city of Barcelona, offers a careful protocol for the reuse of architecture.

On the other hand, a publication edited by Professor Andrea Crudeli in the context of the *Reuse Italy* platform, *Adaptive Reuse: Theoretical Glossary and Design Labs* (Crudeli 2024), whose title summarizes its intentions, has recently appeared. The novelty of this publication was the invitation to a number of architects and academics to propose concepts to outline the reality of reuse. In the Italian context, characterized by a potentially overwhelming accumulation of layers and cultures, this concern and this initiative are well understood. The platform's manifesto is illustrative and, although it refers to the Italian example, can be applied to many other territories to a greater or lesser extent:

> *The Italian landscape is dotted with forgotten historical buildings. Reuse Italy is a benefit corporation that aims to draw public attention to this issue over the long term by promoting activities that demonstrate the feasibility of revitalizing these ruins through renovation. We believe that refurbishing the abandoned historical environment is a valuable resource for Italy, and that architectural projects should play a crucial role in this process. We advocate for the importance of the architectural project in the reuse process thanks to workshops, competitions, exhibitions, documentaries, and publications, in collaboration with national organizations, institutions, world-renowned architects, and the local communities*. (Reuse Italy 2022)

In this text, much weight is given to the architectural project, which is understood as a wise formalizing action that leads to reuse without losing the historical and artistic values of heritage. To this same extent, the role of architecture as an active exercise in the conservation and enhancement of the cultural heritage of each territory should be justified.

Authors should discuss the results and how they can be interpreted from the perspective of previous studies and of the working hypotheses. The findings and their implications should be discussed in the broadest context possible. Future research directions may also be highlighted (Figure 7).

Figure 7. Transformation of the former convent of San Pablo in the area of Hoz del Huécar in Cuenca into a Parador Nacional. Architects: Manuel Romero and Antonio Escario.

5. Methodology and Work Plan

For the execution of what we have called a *heritage rebalancing plan from the sacred*, the methodology will focus, first of all, on determining the geographical areas of study and work. Although the natural units are the settlements themselves, the administrative units can also be used, whether they are religious or not. In the Spanish case, dioceses can be used due to the overwhelming preeminence of the Catholic religion, although this decision depends on the circumstances of each case and other equally valid criteria may be found.

In any case, it is advisable to incorporate the competent religious administrations in each context under the condition of *Observer Promoting Entities*[6] (OPEs), applying the doctrine of the first and legitimate correspondence of patrimonial care already detailed above and an elementary principle of respect for the property.

It is clear that resistance of all kinds will be experienced, for example, from the parish communities that, although diminished for reasons of age and other factors, may not willingly accept their dissolution into other structures. Other forms of resistance may come from the field of historic preservation, whose determinations may clash with any kind of change. The same may be true of any bodies having to do with land ownership. Here, resistance is understandable and must be resolved, as in the previous cases, through an open and sincere dialogue that considers the common good and the establishment of compensation that is satisfactory for all parties.

The same may be achieved with civil administrations, whether local, regional, or national, of a secular—municipalities, autonomous governments, and national government—or religious nature—religious orders or groupings or any institution of the different communities—that may be invested in the objectives of this project and of any religious, cultural, educational, research, social, etc., associations that are involved in this process[7].

The participation of the leaders and administrations of all the denominations present in society are considered particularly valuable, since, in this work of rebalancing, accommodating all the sensitivities and denominations present, regardless of their degree of implantation, is important. Given that the resources in question are private, when it comes to matching the assets contributed and the new facilities, an elementary principle of justice, not exempt from generosity, will be observed, so that no undesired transfer of funds or resources will take place.

As already mentioned, each diocese—or geographical/administrative area finally determined—and the settlements—towns and cities—likely to be included in the plan should be determined. Basically, it is a matter of locating historic centers with a certain density or the presence of buildings with little demand for operation or in disuse. To this can be added the condition of a growing population with a periphery having pastoral needs that justify their inclusion in the project.

Both the properties and the needs of the neighborhoods, peripheral or not, should generate a cartography of the settlements, since in this work of rebalancing, it is essential to measure the distances and the areas of attention according to criteria of sustainability and economy of resources.

The first criterion of attention should be that of religious care, which should never be omitted from the responsibility of confessional or non-confessional institutions. Let us not forget that the first driving force of this plan is improving the conditions of religious communities.

A subsidiary area of study should consider social and cultural care, identifying the deficiencies, needs, and desires of societies. Finally, these two maps should be superimposed to generate a single cartography that maps their complementarity and operational reality. This document is key to launching the process and should be the object of special attention both by the religious institutions concerned and by the civil society in which they

are embedded. Only from a commitment to understanding and service to all, to whom the purposes of both the religious and the civil authorities are ultimately oriented, will it be possible to activate the project.

The next step is cataloging the religious buildings that can be included in the project, including in the corresponding files all aspects of interest to the case: quantitative aspects such as surface area, volume, and façade frontage, and qualitative aspects such as natural lighting, state of conservation, etc., as well as historical, artistic, patrimonial, and other aspects that can be taken into account. This chapter can also include purely religious aspects such as pastoral concerns or those linked to the tradition of the place, which, in some cases, may be key. It should be noted that if the first cartographic document is important, this second one is decisive in establishing a position on the eventual decommission and use change of the corresponding buildings.

The last step in this process is the drafting of a detailed report including all the previous documents, as well as a reasoned explanation of the final proposal for the buildings that would retain their current use, those susceptible to change of use, and those to be built in the peripheries. This final document should also include a detailed economic report to evaluate the compensations, costs, and all kinds of disbursements connected with the implementation of this project. It should be noted that its activation may generate a large number of projects and works that should be undertaken with ambition and far-sightedness, following the example of earlier times, the same times during which some of the included buildings were built.

From a methodological point of view, we again cite the work of the UPC's (Habitar Research Group n.d.), directed by Professor Xavier Monteys, which was applied to the city of Barcelona in the publication *Atlas del aprovechamiento arquitectónico. Estudio crítico de los edificios reutilizados en Barcelona*: Atlas of architectural utilization / A critical study of reused buildings in Barcelona (Monteys et al. 2018).

In one of its last chapters, this work includes a series of recommendations for the reuse of architecture, whose essential statements are collected here as experiences worthy of attention:

> *-Modify state and autonomous (local) regulations.*
>
> *-Plan the change of use.*
>
> *-Promote education, training and social awareness in favor of reuse.*
>
> *-Prioritize reuse over demolition and new construction.*
>
> *-Adapt the use to the building, rather than adapting the building to the use.*
>
> *-Carry out a protocol that diagnoses the typological and formal characteristics of the building in order to know its capacity for repair and adaptation to new uses.* (Monteys et al. 2018)

The aforementioned document expresses a final reflection that deserves our attention as a model of the project that we describe here and that summarizes much of the spirit that has been expressed up to this point:

> *The built park cannot be a frozen landscape, it must be active. When the activity in a building ceases, reuse and change of use must be the driving force of dynamization. In this sense, the doors opened by new technologies and social networks through new apps are inspiring. If we were able to manage spaces in disuse in the same way, we would achieve an agile and practical management of the available space, which would allow us to occupy the space without hardly acting on it, without reforming it, adapting the use and the user to the property and not the other way around, since use (as this Atlas shows) is the best "preservative" for the life of buildings and ultimately of our cities. All this leads us to interpret the ownership or use of the property as something temporary, to the*

point of taking as a slogan that of a Swiss watch brand that states that the watch "is never entirely yours" since it will always continue to be used by the following generations. Consequently, "you can only take care of it". If the same thing happens with the building stock, it would be logical to apply, in the practice of reuse, either minimal operations or reversible construction systems that allow the building to always be adaptable and reconfigurable to the new needs of its user.

At the end of this research we found that in the end it is not so much a matter of reusing buildings, but of continuing to use them, of understanding the building as an organism, to which we adapt throughout different life cycles. (Monteys et al. 2018) (Figure 8).

Figure 8. Transformation of the old church of San Vicente into a Cultural Center in Potes, Cantabria.

6. Final Objectives and Expected Benefits: Conclusions

In conclusion, both the final material objectives, i.e., the documents that comprise the complete plan and the benefits to be expected from its implementation, are set out below.

1. Drawing up a catalog of examples of the decommission and use change of places of worship. This point is generic and could include models inside and outside the geographical area of study, understood as case studies from which to examine the lights and shadows.
2. The precise mapping of the location of places of worship in the city centers and in as many areas that meet the density conditions established in advance. The same should be done with the peripheries in this area, looking for plots that could be used for the location of future religious facilities. A good measure can be the drawing of complete

plans of the cities, indicating the areas with an overabundance of religious facilities and those with a deficit.

3. Cataloging and surveying the buildings that can be included in the project. At this point, it is necessary to assess not only their artistic and architectural value but also their weight in the memory of the faithful and users and of the city itself, to offer data on their possible evolution and future destiny. Here it should be noted that it will be rare to find a place of worship that does not have some kind of tradition. In other words, all buildings will have their history—large or small—but it is important to understand that it will be necessary to make sacrifices in order to obtain other assets. This is the secret, if it can be called that, of this project.
4. Proposing the maintenance of some places of worship and the decommission of others. Assessments of their conditions—spatial, artistic, visual, acoustic, etc.—should be conducted with a view to changing the use of the latter. It is also advisable to study in detail the destination of movable pieces—paintings, sculptural groups, liturgical elements, etc.—linked to the buildings whose decommission is proposed and that could be transferred to other places of worship.
5. Finally, and although the details of the reuse projects—especially those of new plants in the peripheries—are beyond the scope of this strategic work, addressing some cases of both situations is important to provide examples of what is intended.

As for the benefits expected from the implementation of the plan, the following are listed, which will be of enormous significance for the cities where it will be applied. One can speak of a truly historic moment for the settlements affected by the plan, as it will be a turning point in many areas. The first consequence of this project will be the availability of precise documents for the rationalization and rebalancing of the sacred heritage of the cities, both in the center and in the peripheries. Likewise, the documentation generated will enable proposing the transformation of certain sacred buildings in the city centers for cultural and social purposes, enriching this dimension in the cities under study and work.

In other words, we expect results in terms of better attention to the faithful who attend religious practices, since the concentration of centers where these practices are offered will result in denser and, therefore, more active communities. In addition, the concentration of resources will also lead to better attention to the material dimensions of the celebrations, perhaps activating the practice and, in any case, improving it. This goal, which is not easily measured, and which will pose logical difficulties in the face of changing customs, etc., is one of the first objectives and must be assumed by the corresponding hierarchies as an improvement. In this sense, the messages of Pope Francis in the context of the Catholic Church, which proposes an advance toward *"the peripheries"*, resonate with the intentions of this project.

> *Since his episcopate in Buenos Aires, he has realized that the "ends of the earth" are not only places, but also and above all people, as he said in his intervention during the pre-Conclave General Congregation meetings of the Cardinals: "The Church is called to come out of herself and to go to the peripheries, not only geographically, but also the existential peripheries: the mystery of sin, of pain, of injustice, of ignorance and indifference to religion, of intellectual currents, and of all forms of misery".* (Francis 2013)

The reuse of some religious buildings after their decommission will also lead to a more efficient maintenance of these buildings that is derived from their use. It is well known that buildings with limited activity face the passage of time the worst. It is a matter of maintaining their heritage values linked to the collective memory, albeit with an alternative use. Many of the buildings we have discussed have spatial, acoustic, visual, and other conditions that can be put to other purposes. However, it is above all their privileged location in the urban fabric, which is more or less dense depending on the cities and their

centers, that will offer the opportunity to re-densify the cultural or other types of facilities in these same communities.

For this transformation work, it is essential to have experts in art and architecture—in their historical and heritage values, and their social and, where appropriate, religious dimensions—to propose the best strategies for the transformation of buildings. We have already mentioned the necessary decommission for the proposed purpose, but it is also necessary to decide whether to maintain certain elements that represent their past use and are part of their heritage value. In the event that the removal of some heritage element such as an altar, furniture, or an image is deemed appropriate, it should be relocated for worship in another church or reserved in another facility, preserving its functional sense—the most desirable—or placed in a diocesan museum or other institution that is deemed convenient. This work fundamentally guarantees the maintenance, if necessary liturgical and in any case patrimonial, of the removed pieces.

Finally, it should not be forgotten that the ultimate goal of this project is the rebalancing of religious endowments in cities and towns. Therefore, in parallel to the policies already described and with the same attention, the planning of new places of worship in the peripheries or neighborhoods that are less well-endowed should be considered. In other words, the ultimate objective should be a certain urban rebalancing, considering areas with a surplus of facilities and those with a deficit, linking the transfer of centers in the former state with the construction of new ones in the latter by means of the appropriate contribution of land and resources. It is important to express an overall vision and even to generate a reserve of resources for the future, given that the growth of the cities will continue at a more or less constant rate.

As we have already pointed out, the great benefits of this project in all these areas are evident, and we can speak of a major urban transformation affecting many of its layers—social, cultural, religious, educational, commercial, and others—pointing to a *new awakening of the cities*.

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Notes

1 ICCROM is an intergovernmental organization working in service to its Member States to promote the conservation of all forms of cultural heritage in every region of the world. It operates in the spirit of the 2001 UNESCO Universal Declaration on Cultural Diversity, which states that *"Respect for the diversity of cultures, tolerance, dialogue and cooperation, in a climate of mutual trust and understanding are among the best guarantees of international peace and security"*. https://www.iccrom.org/about/what-iccrom (accessed on 4 June 2024).

2 ICOMOS works for the conservation and protection of cultural heritage places. It is the only global non-government organization of this kind, which is dedicated to promoting the application of theory, methodology, and scientific techniques to the conservation of the architectural and archaeological heritage. https://www.icomos.org/en/about-icomos/mission-and-vision/mission-and-vision (accessed on 4 December 2024).

3 Thomas Coomans talks about *"nightclubs, casinos, bars, etc."*. *What can we learn from half a Century of Experience with redundant Churches? A critical Evaluation of a Heritage at Risk*. At Fabrizio Capanni (Ed.) p. 60.

4 It should be noted that this concern for the formation of pastors and the faithful in matters of liturgy, art, and patrimony is insistently reflected in numerous documents, such as the Second Vatican Council's Constitution on the Sacred Liturgy

"Sacrosanctum Concilium" (nn. 14–20). https://www.vatican.va/archive/hist_councils/ii_vatican_council/documents/vat-ii_const_19631204_sacrosanctum-concilium_en.html (accessed on 15 June 2024).

[5] This is analogous to how metaphysics refers to physics, to the material reality we experience.

[6] As established in the *Spanish National Research Plan*, these entities are companies or public or private entities that, being aware of the objectives of the project, have expressed their explicit support for it by collaborating in the monitoring or active participation in the work—including providing financing, personnel, services, or any other means deemed appropriate—supporting and collaborating in its execution and in the exploitation and transmission of the research results through publications, exhibitions, etc.

[7] Among those with which we have already established international contacts of a different nature in the past, we could mention, among others, the following: Centro Studi per L'Architettura Sacra e la Citta'–Fondazione Cardinale Giacomo Lercaro (Bologna, Italy), Fondazione Frate Sole Promozione Arte e Architettura Sacra (Pavia, Italy); Architecture, Culture & Spirituality Forum (Washington, DC, USA); London Jesuit Center (London, Great Britain); Ufficio Nazionale per i Beni Culturali Ecclesiastici e l'edilizia di culto–Conferenza Episcopale Italiana (Rome, Italy); Academia dei Virtuosi del Pantheon (Rome, Italy); as well as to some Universities with programs related to transcendence: KU Leuven (Leuven, Belgium); Catholic University of America–School of Architecture & Planning (Washington, DC, USA); and University of Notre Dame School of Architecture (South Bend-Indiana, IN, USA).

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Article

Ephemeral Religious Architecture—The Visits of the Pope to Madrid

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Abstract: On the occasion of mass religious events, liturgical ceremonies leave the temple and occupy public space. That is the case of the visits of the Pope or World Youth Days. How does architecture approach the ephemeral construction of this space? What architectural strategies can be used? In the city, the roles are inverted, and the exterior public space becomes an interior delimited by streets and facades that contain the assembly of faithful. How can this urban transformation be "designed"? This article presents several architectural strategies materialized in a series of ephemeral religious architecture projects in the city of Madrid: the stands for the visit of the Pope in Santiago Bernabéu Stadium, Plaza de Colón, Plaza de Cibeles, and Cuatro Vientos airfield. Each of these projects, located in very different urban settings, proposes a different architectural approach. It is evident how the architectural project is, in each case, a response to the characteristics of the urban site in which it is located. City and architecture establish a direct and reciprocal relationship, in which the urban form shapes the architecture that hosts the religious event; vice versa, architecture integrates the city, its limits, its streets, and its facades into the project.

Keywords: ephemeral architecture; religious architecture; sacred space; urban space; Madrid

The city features beautiful and dignified spaces, potentially suitable for certain religious celebrations. When the events are simple, the city itself is sufficient: streets and squares become walls, façades become altarpieces, and passages become corridors. These large-scale monumental elements transform the conception of urban space through minimal actions; the reorganization of places where people stand, the stopping of traffic, the placement of furniture, or the traditional processions are economical and effective operations that momentarily modify the perception of the city and enrich the life of its inhabitants (Arboix-Alió and Mària Serrano 2013).

However, the Pope's visit to a city involves a deployment in which the urban space and these small performances alone are not enough. The level of logistical and programmatic demands, together with the enormous influx of people around a single person, make it necessary to build an ephemeral architecture that structures the space, integrates it with the existing city, and signifies the principal of the religious act presided over by the Pope.

Over the last few years, Vicens + Ramos architecture studio has had the opportunity to act in the city of Madrid (Figure 1) for the adaptation of the platforms for the visit of the Pope. With John Paul II, these were in 1982, in Santiago Bernabéu stadium; in 1993, in Plaza Colón; and in 2003, again in Plaza Colón and Cuatro Vientos aerodrome. With Benedict XVI, this was in 2011 on the occasion of World Youth Day, with stages in Plaza Cibeles and again at Cuatro Vientos aerodrome.

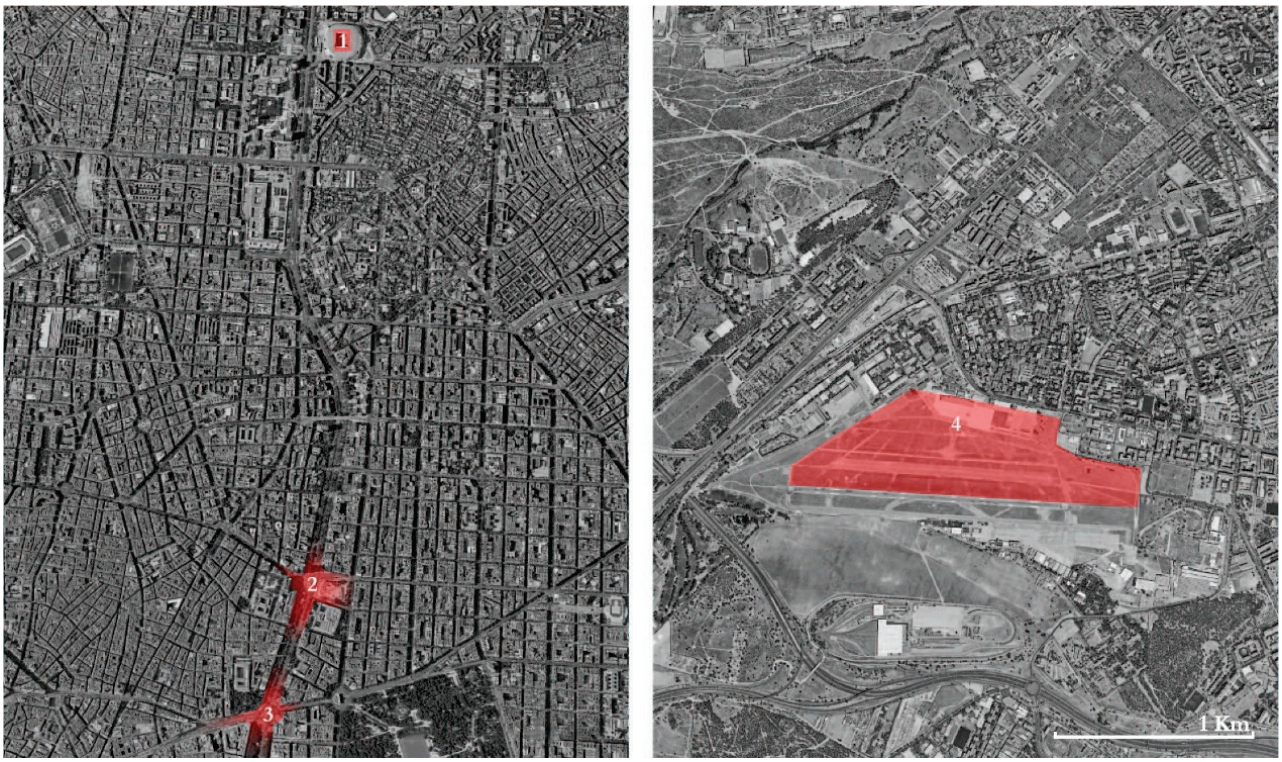

Figure 1. Map of Madrid. **Left**: 1, Santiago Bernabeu Stadium; 2, Plaza Colón; 3, Plaza Cibeles. **Right**: 4, Cuatro Vientos Aerodrome. Source: Vicens + Ramos.

In all these architectural interventions, there is one main objective: to highlight the presence of one person in a million; to see and hear the Pope perfectly. They must also respond to three major challenges: understanding and integration into the existing urban setting, the significance of the architecture as a visible symbol, and the resolution of the program and its temporal condition. The objective of this article is to present these ephemeral architectures by detailing the conception and project process from two complementary perspectives: first concerning the urban context in which they are located and second in relation to the architectural form as a symbol.

The article utilizes a comparative approach between the projects as a research tool (Mària Serrano and Musquera-Felip 2023), focusing particularly on graphic comparisons of drawings at the same scale, original project sketches, and relevant references.

1. Antecedents

There is no specific Church document on liturgical space in ephemeral architecture. However, to the extent that the liturgy itself requires it, the same requirements as a conventional church must be taken into account. There are many relevant post-Vatican II texts on sacred art and liturgy to be taken into account in the design of spaces for liturgical celebration. We highlight the documents *Inter OEcumenici* (Acta Apostolicae Sedis 56 1964), *Letter on the Conservation of the Historical Artistic Heritage of the Church* (Acta Apostolicae Sedis 63 1971), and *Pastoral Liturgical Directory on Setting and Art in the Place of Celebration* (Pastoral Litúrgica 1987), among others, collected in the compendium by Andrés Pardo (Pardo 1992). Before approaching the specific analysis of the interventions, it is important to highlight three main lines of references and background that converge in these projects. The first gathers a whole tradition of ephemeral architectures that in Spain has a great development from the early sixteenth century to the eighteenth century, with a special focus on Baroque Madrid. Secondly, other relevant projects from the XX century, and finally,

Vicens + Ramos research developed in their professional career in the field of contemporary sacred architecture. (Vicens Hualde and Ramos Abengózar 2007).

The city of Madrid, In particular, has a profound historical relationship with Baroque ephemeral architecture. Antonio Bonet Correa described this period in Baroque Madrid, where the lack of monumentality of the city in comparison with other great capitals, was counteracted by a great display of ephemeral structures that embellished the city for great occasions and radically transformed it: false facades for processions and parades, provisional altars, triumphal arches or tumuli, and catafalques (Bonet Correa 1993). Luis Moya Blanco placed special emphasis on the scenographic and festive character of the city of Madrid at that time, which was adorned with great dazzling events such as royal weddings, receptions, funerals, canonizations, or entrances of kings and ambassadors, for which "false architectures of wood, plaster and cloth were applied on its smooth and poor walls, (. . .) and in the same way, triumphal arches, temples and colonnades were made, placed in such a way as to enhance the picturesque effect of streets and squares" (Moya Blanco 1952, 11). Some of these Baroque ephemeral architectures have been analyzed and redrawn in the thesis *Baroque Ephemeral Architecture* by Ignacio Vicens (Vicens Hualde 1986). They are a clear reference and are part of the imaginary of the Vicens + Ramos studio when approaching these projects.

Among the notable precedents of temporary altars in contemporary architecture, two important projects from the 1950s are worth mentioning: by Rudolf Schwarz in 1956 in Cologne, on the occasion of the LXXVII German Catholicism Conference, and his work *The Church incarnate* (Schwarz 1958); and by Josep Soteras Mauri in 1952 in Barcelona, developed for the "XXXV International Eucharistic Congress". Scholars such as Esteban Fernández Cobián (Fernández Cobián 2005) (Fernández Cobián 2010) and Eduardo Delgado Orusco (Delgado Orusco 1999) examined these projects and drew connections to the architectural works of Vicens + Ramos discussed in this article.

Finally, these small ephemeral projects of sacred architecture are part of a broader research and professional practice, which is related to the projects of churches designed by Vicens + Ramos throughout their career. This research, both practical and theoretical, has been presented and published in several conferences, including the I International Congress of Contemporary Religious Architecture (CIARC) "Architectures of the Sacred. Memory and Project" (2007) or the III CIARC "Beyond the Sacred Building. Architecture and Evangelization" (2013).

2. Existing Urban Space—The Strategy

2.1. Santiago Bernabeu Stadium, 1982

The first project took place on the occasion of the visit of John Paul II in 1982 to Santiago Bernabéu Stadium (Figure 2), to celebrate a meeting with young people. A football stadium is a construction that is halfway between an urban space and a building. This intermediate condition is more accentuated when its original function as a sporting event is altered: the playing field, a piece of grass unreachable to the public, becomes a place for the public to sit in.

Suggesting that the Pope be surrounded by as many people as possible was the first decision. Santiago Bernabéu Stadium is already designed to accommodate thousands of people around an event. It is also a very vertical stadium compared to others with even greater capacity, which gives a sense of closeness to the audience. The stadium itself, therefore, meets a very important part of the initial requirements. The stands are the walls of the great theater and they do not need any refurbishment. The intervention began, therefore, where the pre-existing was not sufficient. Instead of placing the Pope in the tribune, it was proposed to place him on the lawn, in the middle of the stadium and

free-standing, allowing people to occupy the lawn and increasing the capacity by around 40,000 more people. To this end, a white baldachin was built on a podium that would allow the Pope to address the crowd with a 360° view, enhancing the enveloping quality of the stadium itself.

Figure 2. John Paul II in Santiago Bernabeu Stadium, 1982. Source: Album/Oronoz.

2.2. Plaza Colón, 1993 and 2003

Ten years later, the placement of a baldachin at a central point was also the ideal strategy for the platform in Plaza Colón both in 1993 and 2003 (Figure 3), despite the context being completely opposite to the homogeneous and delimited environment of the Bernabéu Stadium. Plaza Colón in Madrid is a large and indeterminate urban space, fairly chaotic, with buildings of all kinds, with banners and pennants, and without unity. The platform was located in a central position, at the visual confluence of Castellana, Goya, and Genova streets, which prevented the construction of a background element for the Pope, who must be identifiable from all four directions.

In this context, a focal element was needed, a reference that would stand out against all the noise of the surroundings, and it was essential that its language should be one of serenity. The baldachin, at the same time as it was a symbol of the Pope, was the solution to these site conditions: it was a very specific element, with little horizontal development, which allowed it to be seen in its entirety from the distant perspectives created, for example, by Génova street, which descends towards Colón, or from the visual corridor created by the trees of the boulevards of Paseo de Recoletos and Castellana. To make it stand out, it was also placed on a series of platforms to raise it and make it more visible, thus solving other types of programmatic problems.

Figure 3. Platform for John Paul II in Plaza Colón, 2003. Source: Vicens + Ramos.

2.3. Plaza Cibeles, 2011

A few years later, a meeting with the Pope took place less than 600 m from Colón, in Plaza Cibeles. This is also an urban situation with a confluence of large streets, but this square is dominated by the presence of a large building, an undeniable landmark, in front of which a platform was to be built: the current Town Hall, formerly the Post Office Palace, designed by Antonio de Palacios. With its neo-Plateresque façade, full of detail and great expressiveness, it acted as a great urban altarpiece (Figure 4).

Figure 4. Urban site plan of Santiago Bernabeu Stadium (**left**), Plaza Colón (**center**), and Plaza Cibeles (**right**). In red the focal points of the projects (where the Pope stands). The red line marks the façade of the Town Hall than works as a background for the project. Source: Vicens + Ramos.

The aim was to create a serene, soft space that would not compete with the existing architecture and would emphasize the presence of the Pope and his message. A clean, white surface was proposed that would curve in on itself, encompassing the liturgical space and creating an envelope; an abstract and clear operation, designed to stand out in silence against the imposing architecture in the background. This operation also solved another problem arising from its position in the square: since it had to be attached to a concave

façade, the more it faced the square, the more visible it would be. The curved, cantilevered plane allowed it to lean out and make its presence felt, but avoided any lateral elements that might obstruct side views.

2.4. Cuatro Vientos Aerodrome, 2003 and 2011

All these approaches to architectures that are in dialogue with the existing city change radically when they are proposed in a completely empty environment without references, in an open field and without visual restrictions, as is the case with the Cuatro Vientos aerodrome—a place chosen twice: for John Paul II in 2003 and for Benedict XVI in 2011 (Figure 5). In this place, the important thing is to create a background that serves as a reference. It is no longer a question of competition or dialogue, but of a construction that focuses attention in the midst of a place of almost unfathomable dimensions. It must, therefore, be a large building, with dignity in itself and a certain expressiveness.

Figure 5. Platforms designed for Cuatro Vientos Aerodrome, in 2003 (**left**) and 2011 (**right**). Source: Vicens + Ramos.

In 2003, a very geometric solution was proposed based on a large yellow wall that served as a monumental backdrop. A large white canopy flying over the wall marked the place of the Pope. A luminous cross on one side and a large screen served as a counterpoint. The rest was resolved by a series of platforms, also white.

In the 2011 proposal, the scale and location of the platforms were the same, but with a very different image: a large white topography, made of recycled fabrics stiffened and painted white, which acted as a large backdrop and were curved to form the same raised floor in continuity. It was a proposal of great material expressiveness, but at the same time of great essentiality. In the middle of this, a sculpture was created to symbolize a large tree that shaded, signaled, and illuminated the main place. These were two solutions which, in relation to the urban platforms, were much more expressive and prominent. Perhaps they had a very different language and materialization, but they had a similar essential nature: two colors, rounded and clear elements, similar dimensions, and a similar way of structuring the pre-existing space.

It is clear from this series of proposals (Figure 6) that the understanding of place is the first major factor to be taken into account. The qualities of the urban environment in which they are to be inserted are the trigger for the project itself. The space available is much more than an area that can be used for seating. Architecture must enhance the intrinsic qualities of the site, identify the defining elements, and ensure that the architecture enhances or, where appropriate, complements them. Dimension, expressiveness, geometry, orientation, materiality, and language, among others, are specific tools of architecture that must be put at the service of not only the building itself, but also of the city and its surroundings.

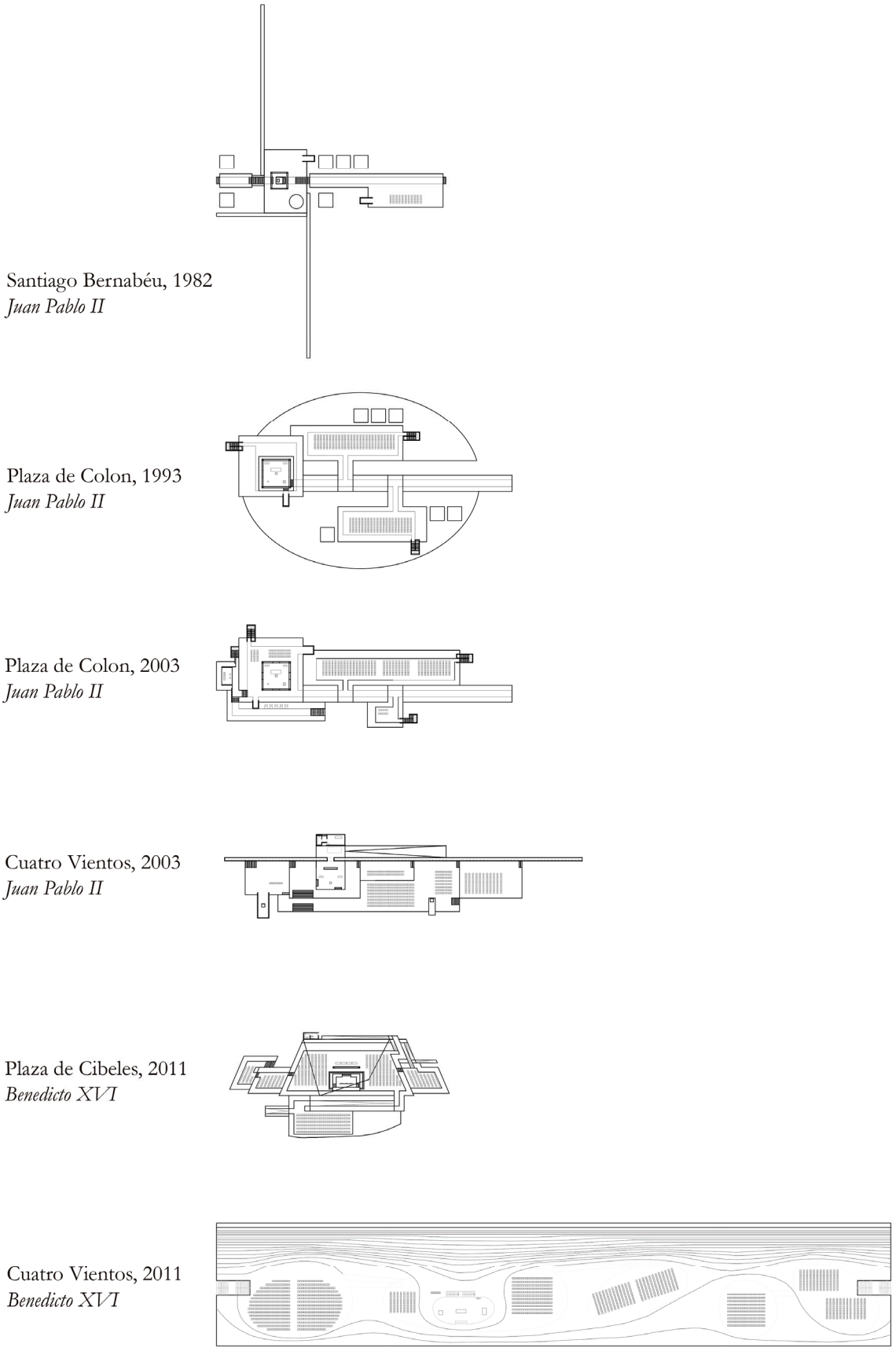

Figure 6. Catalogue of ephemeral architectures built for the visits of the Pope to Madrid. From top to bottom: Santiago Bernabéu, 1982, John Paul II; Plaza de Colón, 1993, John Paul II; Plaza de Colón, 2003, John Paul II; Cuatro Vientos, 2003, John Paul II; Plaza de Cibeles, 2011, Benedict XVI; Cuatro Vientos, 2011, Benedict XVI. Source: Vicens + Ramos.

3. Signifying Architecture—The Visible Symbol

Beyond the strategy adopted about the city, which has to do with the understanding of place, architecture must be meaningful. Michael John Zielinski says "that the church space should still strive to answer that need of the sacred that dwells in each of us" (Zielinski 2013). It is not about creating a theater stage, but a space that has real meaning in accordance with the act that takes place in it, in this case a liturgical act. In this sense, it is important to fulfill a series of requirements, which will be defined later, but above all, the halo of the sacred must hover over them.

On the other hand, Sacrosanctum Concilium[1] insists upon the irrevocable value of the aesthetic dimension of liturgical buildings. Historically, the Church has been a protagonist in an incessant adventure of creativity, and conserved the richest artistic treasure; consequently, and in accordance with its historic role, which must not be interrupted, combined with its Catholic, universal, and open disposition, the Church claims an attitude that encourages art without adhering to a specific style by accepting the forms of each time: "the art of our own days, (. . .) shall also be given free scope in the Church, provided that it adorns the sacred buildings and holy rites with due reverence and honor; thereby it is enabled to contribute its own voice to that wonderful chorus of praise in honor of the Catholic faith sung by great men in times gone by" (Sacrosanctum Concilium 1963, VII, 123).

It is, therefore, necessary for a space of this type to respond in a contemporary way to both the spiritual and aesthetic dimensions, taking into account the legacy of the Church. To this end, the ephemeral architecture built must carry a meaning, which, in its dialogue with the pre-existing space, forms a true space suitable for worship.

Moreover, each of these projects can be associated with elements and typologies of Baroque ephemeral architecture, such as baldachins, altarpiece façades, and landscapes (Figure 7). This connection references the urban scenographies and ephemeral architectures of the Baroque period, as discussed by Bonet (Bonet Correa 1993).

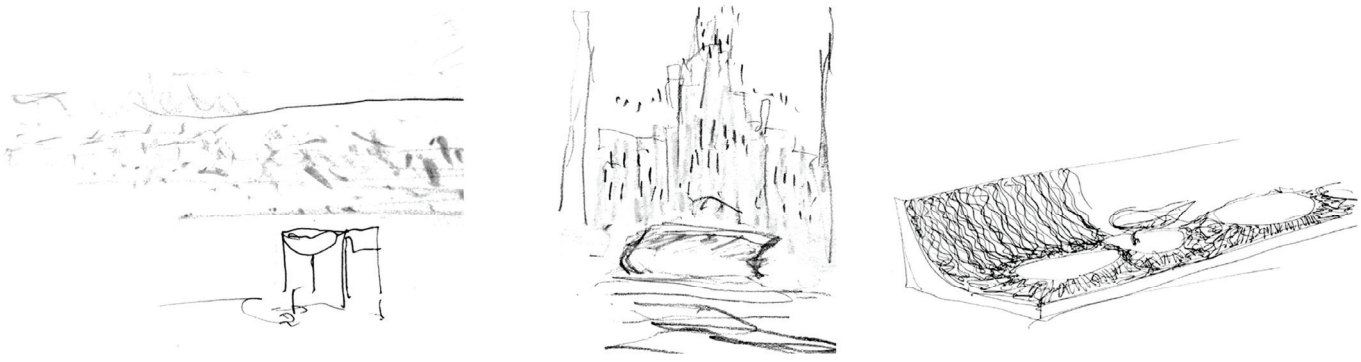

Figure 7. Original drawings. Bernabéu—baldachin, Cibeles—altarpiece, and Cuatro Vientos—landscape. Source: Vicens + Ramos.

3.1. The Baldachin

One way of entering into dialogue with ecclesiastical tradition and creating a place for the celebration of the liturgical act is to use an element typical of sacred architecture. For both the Santiago Bernabéu and Colón platforms, a baldachin was built in a central position. As already described, this solved several environmental problems and gave order to the space. The baldachin[2], which combines architecture and furniture, was historically used in churches to mark the altar as the most important place in the room. It was often made of textile elements that hung like a canopy, 'dressing' the space. This textile condition, associated with the word itself[3], was explicitly reflected in Santiago Bernabéu (Figure 8).

It was a white structure that outlined the edges of a square prism, 5 m on each side and 7.5 m high, through columns and beams with a square section of 30 cm on each side. On top of this structure, there was a piece of fabric that fell in a catenary from one side of the structure to the other in a natural way.

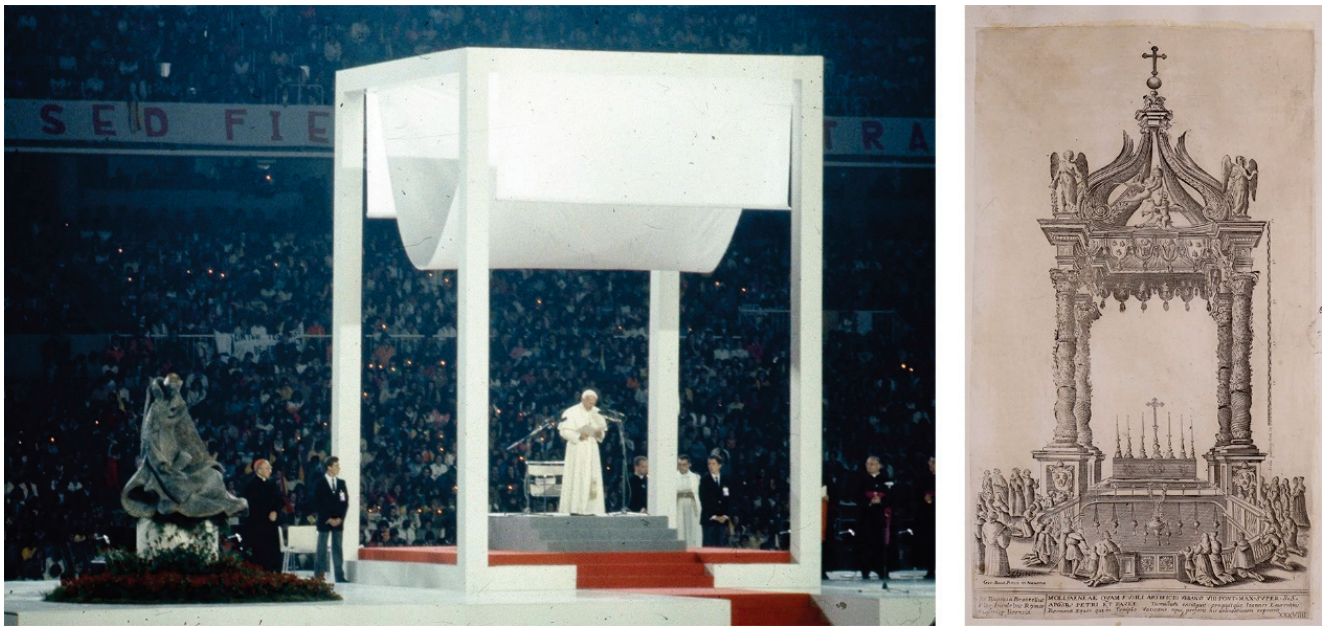

Figure 8. Left: Baldachin in Santiago Bernabeu Stadium for John Paul II, 1982. Source: Album/ABC. **Right**: Baldachin in St Peter's Basilica in Rome. Engraving by Giovanni Battista Bracelli, 1650. Source: Database of Real Academia de Bellas Artes de San Fernando, academiacolecciones.com.

The second baldachin, set in Colón in 1993, had to be larger because the space was larger and the program more complex. On this occasion, this element was reduced to its most abstract and pure form, a cube of 8.50 m on each side, eliminating the piece of fabric and covering everything with a clean, solid plane. Finally, in 2003, in the same urban place, the same proportions as in 1993 were used, again covered with a fabric, but in this case stretched, which made it possible to recover this historical value and at the same time to better control the shadows cast without losing the clarity of the supporting structure.

However, regardless of the proportions and the use of the fabric, in all cases, it was decided that the language of the design should be extremely sober and simple, but at the same time effective and beautiful. A single color and a single material were used, which was one of the reasons for the design's success: clarity and sobriety, so that nothing would distract from what was really important, namely, the Pope and the ceremony.

3.2. The Altarpiece

In Plaza Cibeles, the façade of the City Hall building was already capable of becoming, almost by itself, a reference to the sacred space. Its symmetrical, monumental, highly expressive façade, crowned with pinnacles and rich in detail, had many elements in common with a Baroque altarpiece. Any attempt to compete in form ran the risk of being diluted or saturated by the scale of the building. It was, therefore, decided to create only silence amid all this formal and monumental display, so that their contrast would enhance each other. This gives prominence to what already is there, by making the form almost disappear. This does not mean being invisible, nor was that what was sought, but it does mean striving to reduce it to the minimum expression (Figure 9).

Figure 9. Concept image. Platform for WYD 2011 in Plaza Cibeles. Source: Vicens + Ramos.

The form was derived from the curvature of the plane of the floor on itself, creating a roof; a simple operation that at the same time 'protects' the venue in the middle of the city. On the one hand, the space that folds in on itself creates a concave form that is, by definition, inviting. It is a form that both protects and dilutes the boundary between the plane of the ground and that of the sky, eliminating any horizon line and embracing mystery. On the other hand, the reference to a great white cloak that embraces the community is a reference to the Virgin, whose image needed to be present.

3.3. The Landscape

The design of Cuatro Vientos for WYD 2011 was perhaps the most direct from the point of view of meaning: a landscape was designed, i.e., a large topography that represented the spiritual path, like the ascent to the mountain of Christ (Figure 10). The mountain as a place of preaching, as a place of sacrifice, was the argument that gave meaning to the intervention.

This image had to be created with the appropriate serenity and language. As the only element of reference, it had to be the support for everything, and as such, it had to be an element capable of taking center stage when necessary and disappearing at other times. It was a platform that had to allow for many forms of use at many times of the day. The white surface allowed it to support projected lighting effects for concerts, spaces, and venues for different activities. At night, the tree that shaded the Pope's area during the day was illuminated with its own light, standing out in the middle of the white landscape, symbolizing the light of Christ, like the tree of life. At a certain moment, the custodia of the Cathedral of Toledo was raised from the ground through a hydraulic mechanism, and for a few moments, there was total silence and a moment of Adoration.

Figure 10. Platform for WYD 2011 in Cuatro Vientos Aerodrome. Source: Vicens + Ramos.

This landscape condition is accentuated by the fact that it presided over and acted as a backdrop for a long period of time. The events in the center of the city had to be fast and agile, and when they were over the people had to leave so that the normal rhythm of the city could be restored; however, in Cuatro Vientos, the platform had to preside without interruption for more than 24 h. The pilgrims stayed there for two days, the Pope held a vigil in the evening and a Mass the next morning, and the young people spent the night outdoors. There are many moments that occurred during this time, including the weather, the light, the passage of time, the movement of people. It was ephemeral, but its perception during the time used was very stable.

4. The Encounter with Reality—The Invisible

Nobody realizes—nor have they reason to—that it is much more of what is not seen than of what is. The main thing is for the Pope to be seen well, to arrange the attendees well, for the platform to be attractive, etc. However, underneath all that is an entire world: sacristies for the Pope, cardinals, bishops, and priests, where more than three hundred people can change comfortably, with separate entrances and their toilets; a protected area for the authorities in the event of an emergency; a visitors' room to receive some politicians; a lift so that the Pope can easily get to the level of the Mass (in 2003, for example, John Paul II was already very ill); technical rooms for those who control the sound, lighting and screens; security and safe pathways. Few performances require more dedication than these ephemeral constructions, not to mention the ability to improvise to deal with the infinite number of setbacks and emergencies.

Post-conciliar structures must be multidirectional, with diverse focal points and differentiated spaces. They are complex spaces that include the collective and the personal, where symmetry gives way to eurhythmy, convergence to polycentrism, and a static contemplative disposition to participatory dynamic. This situation, which in the interior space of a church allows the building itself to be the guarantor of a suitable atmosphere and a specific environment in accordance with the intentions of the project, when it is placed in the middle of the city and is intended to respond to everything, runs the risk of diluting the intensity of the action, resulting in a collection of objects, liturgical furnishings, and

scattered places without any order. The architectural project must manage to integrate within this significant architecture that responds to the aesthetic and the visual.

In all the urban projects (Bernabéu, Colón, and Cibeles), the way to solve this problem was to create a new ground plane, through a series of platforms and twin volumes that constituted 'the base'. This base, using the same geometric language, color, and material, made it possible to create all the necessary spaces and circulations without competing with the main symbol (Figure 11). This can be seen by comparing the two platforms in Plaza Colón: one was elliptical and included the islands of the square, while the other was rectangular and located in the middle of the islands. However, the shape of these platforms is essentially unimportant to a spectator 100 m away. It is effective and relevant to the ceremony, as it fits the space and dignifies it, but its formal impact is only what is strictly necessary.

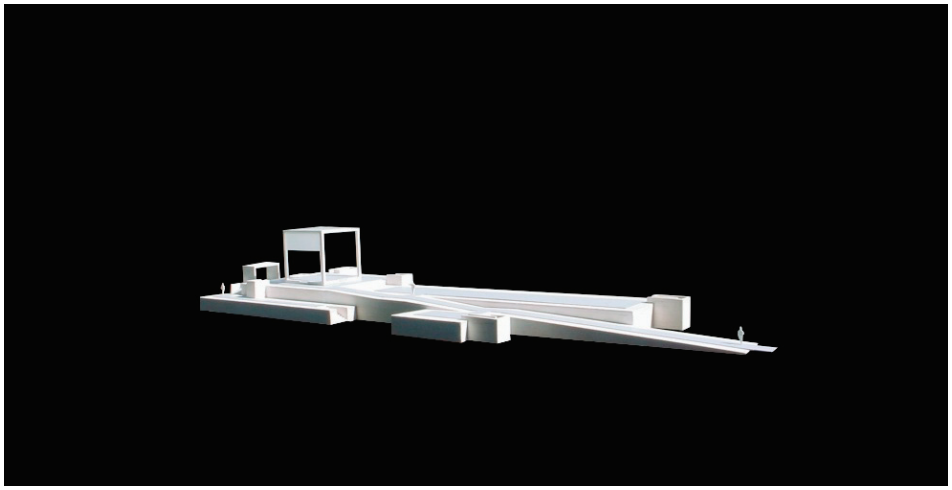

Figure 11. Original model for the platform in Plaza Colón, 2003. Source: Vicens + Ramos.

Far from being a burden, however, this set of platforms is an essential element at all levels. On the one hand, it structures the space; on the other, it enhances the main element, dignifies it, elevates it, marks out circulations, and provides an intermediate area to prepare for arrival. It is not possible to go directly from the asphalt to the altar. It could be said that this 'base' element solves the encounter with reality in all possible senses: firstly, as an encounter with physical reality, with curbs, trees, pavements, etc., with the city from a literal point of view, and secondly, as a meeting with the reality of the program. This is the element that allows the insertion of a significant element of a reality that seeks to transcend the reality of concrete needs. The base is the support in reality from a conceptual, programmatic, and physical point of view.

5. Conclusions

Ephemeral architecture is capable of configuring and transforming urban space. The city provides empty space that can be occupied in many ways. Through the precise placement of an object, it is possible to change the conception of an environment much larger than the surface it occupies. The position, the scale, the architectural qualities of that piece, or its meaning are variables that can be used to achieve this change.

During the visits of the Pope to Madrid, it was necessary to use urban space to host a series of events that no church or cathedral could satisfy. However, these urban spaces are not sufficient on their own and must be adapted for this purpose through certain temporary constructions. Each of the projects, located in very different urban enclaves, proposed a different architectural approach. It is clear that each architectural project is a

response to the characteristics of the urban enclave in which it is located. A direct and reciprocal relationship is established between the city and architecture, in which the urban form itself shapes the architectural piece that hosts the religious event and, vice versa, architecture integrates the city, its boundaries, its streets, and its façades, into the project itself (Figure 12).

Figure 12. Left: Plaza Colón, 1993. Source: Vicens + Ramos. Center: Plaza Cibeles, 2011. Source: Vicens + Ramos. Right: Cuatro Vientos Aerodrome, 2011. Source: Vicens + Ramos.

Given the magnitude of the requirements and the transience of an event of this type, there is a risk of falling into the solution of a technical and logistical problem; in the simple adaptation of spaces that meet the functional conditions; in the construction of a series of platforms and temporary stands, whose systematized assembly and disassembly allows it to solve the problem of time and probably some of its practical functions. However, limiting ourselves to this would mean avoiding one of the essential issues of the event: to transform the city into a sacred space suitable for a liturgical celebration. Neglecting the spiritual dimension would mean reducing the space of the (urban) temple to an ordinary space, neither sacred nor significant, and therefore, useless.

On the other hand, there is a risk that architecture becomes the main focus, distracting attention from what is important. A religious celebration involves both the multitudinous and the personal, because it is a large gathering of people around a central figure, which needs to accommodate the crowd as well as highlight the Pope. However, the Pope is not an aim in himself, but seeks to move people through his message. Therefore, the language of this architecture must allow it to focus on the essence of the act, without claiming prominence.

This is the invisible, hidden, but absolutely necessary work of architecture. It allows things to happen that could not happen without it. Probably, no one will remember the architecture. However, everyone will remember the act and how, for a moment, the city became a cathedral. In this sense, this article aims to be a sort of direct testimony of a fleeting architecture, only salvageable by memory: "The written testimonies or relations and graphic representations, drawings and engraved plates have perpetuated the image of an architecture that, only from the existence of these documents, acquires for us a historical reality, as important and significant as that of the architecture built firmly and in perpetuity" (Bonet Correa 1993, 26).

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Notes

1 Constitution on the Sacred Liturgy Sacrosanctum Concilium was solemnly promulgated by His Holiness Pope Paul VI on 4 December 1963 It is the first document from the Second Vatican Council destinated to the reform and promotion of the liturgy.

2 There are many examples of baldachin types. One of the most known is the baldachin of St Peter's Basilica in Rome, built by Bernini. For more information on ephemeral Baroque architecture, see the work of Ignacio Vicens (Vicens Hualde 1986) and Antonio Bonet (Bonet Correa 1993).

3 Baldachin, from the Italian word "baldacchino", derives from the medieval name of Baldac, the city of Baghdad, where a special type of fabric came from. Royal Spanish Academy Dictionary.

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Article

The Philippines: Open Spaces for Catholic Worship

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Abstract: The Philippines is an island nation in Southeast Asia with a population of approximately 100 million. Its hot and humid climate makes it common for community buildings to be permanently ventilated or even open to the elements. The country's susceptibility to natural disasters, such as earthquakes, volcanic eruptions, and typhoons, also imparts unique characteristics to its architecture, including its religious buildings. Additionally, apart from tiny East Timor, the Philippines is the only nation in the region where the vast majority of the population professes the Catholic faith. The openness of spaces used for Catholic worship can be understood not only from a climatic standpoint but also as a reflection of the Filipino people's identity. Historically, they have not confined their faith celebrations to the interior of churches but have instead utilized public spaces for religious expressions, making these spaces a means of communal affirmation of their national identity. This article explores the typology of open religious architecture in the Philippines, examining both the physical connection between indoor and outdoor spaces—highlighting the environmental or climatic factors—and the temporary nature of its construction, which emphasizes the social or identity dimension. By doing so, it reveals the links between form, function, and local culture in the country's religious architecture.

Keywords: the Philippines; architecture; religious architecture; church and city; public space

1. Introduction

The Republic of the Philippines is an archipelago of 7107 islands with an area of approximately 300,000 km^2 and a coastline of approximately 36,000 km. Its population was estimated to be 109 million in 2020, spread over about 880 inhabited islands.

The Philippines is located in the Tropic of Cancer, and no part of its territory is more than two hundred kilometers from the sea. This means that the average temperature throughout the year is over 30 °C, the humidity is always very high, and the rainfall is intense and abundant. In addition, the country is located in the middle of the Pacific Ring of Fire, between two continental plates, which makes it prone to all kinds of natural disasters, such as periodic droughts, strong typhoons, earth movements, or volcanic eruptions.

If, in any part of the world, the weather conditions determine the construction systems and the general appearance of buildings, in our case, the equatorial climate typical of Southeast Asia requires buildings surrounded by open spaces, with large umbraculums and wide eaves on the roofs, since people usually live on the street and the interiors are only occupied at night or when it rains. In the Philippines, architecture—including religious architecture—needs to breathe, which is why churches are almost never completely enclosed but semi-open, where air circulates and refreshes the environment (Marra 2011).

2. Materials and Methods

This article seeks to trace a sort of typological cartography of open religious architecture in the Philippines, analyzing it from the point of view of both the temporality of its construction and the physical connection between the interior and the exterior, in order to make explicit the links between use, climate, and local culture that manifest in the country's religious architecture. First of all, based on a series of remarkable examples, we show the different resources that architects have implemented to respond to the conditions of openness that the Catholic faithful—more than 80% of the population—demand for their places of worship. Secondly, it explains the conditions that led to the construction of temporary open-air worship spaces for the multitudinous events held in the country over the last hundred years and which show that the Filipino people do not limit themselves to manifesting their faith within the four walls of a temple but have historically used public space for their religious manifestations and, therefore, as an area of communal affirmation of their national uniqueness.

There are well-documented texts on Philippine architecture, not only that of the Spanish period (Klassen 2010; Pérez III 1994; Lico 2019; Martin 2024). The first to study as a whole its modern religious architecture was Fernández-Cobián (2021). In his recent book "Arquitectura religiosa contemporánea en Filipinas" Fernández-Cobián (2024), an abundant bibliography can be found. On the other hand, a few years ago, the topic of outdoor celebration spaces was dealt by himself in an article on ephemeral architectures for Catholic liturgy (Fernández-Cobián 2010), where he expanded on what was presented in his book "El espacio sagrado en la arquitectura española contemporánea" Fernández-Cobián (2005); recently, Carcelén González (2021) has delved somewhat deeper into this topic. During the 3rd International Congress of Contemporary Religious Architecture entitled "Beyond the sacred building. Arquitectura y evangelización", which was held in Seville in 2013, numerous examples of this type of architecture were shown (Arán, Arboix-Alió y Mária, López-Arias, Mardones, Sterken, etc.); but none of them dealt with the Philippines (Fernández-Cobián 2013).

I am aware that, at times, this article may strike the reader as a review article, since that is exactly its objective: to open a barely explored field and put on the table a series of examples that show the different attitudes that Filipino architects have had when facing an open-air church project.

3. Religious Architecture and Climate

3.1. Liturgical Guidelines on Church Architecture

In 1999, the Paul VI Institute of Liturgy of the Catholic Bishops' Conference of the Philippines (CBCP) published a document entitled "Liturgical Guidelines on Church Architecture", in which it expressed concern about the future of religious architecture in the country (Paul VI Institute of Liturgy 1999). It seemed that the newer churches did not conform to the requirements of the Second Vatican Council, that too much attention had been given to their external appearance or simply to achieving an emotionally touching appearance but not so much to responding to the nature and actions of the liturgy to make worship buildings fit their purpose, their space, and their time. The text—which, moreover, was not widely disseminated—was an orderly compendium of the principles and practical norms that could already be found in various official documents of the Holy See and in others of the CBCP itself, to which were added some criteria for the inculturation of religious architecture.

The last part of the document, entitled "Towards a Filipino Religious Architecture", went down to very specific details. For the Philippine bishops, the process of building a church requires a dialogue with the local culture, in which "the planning, design and

layout of liturgical space are inspired and influenced by the planning, design and layout of Filipino houses and buildings" ($ III). Thus, the traditional Filipino family house, with its typological invariants, was held up as an example of "the Filipino Church house", both because, in it, the person was the center of the space and because of its optimal climatic performance.

In any corner of the planet, as stated before, vernacular architecture is determined by the climate but also by factors as diverse as the materials and technology available, historical experience, or the worldview of its inhabitants and by other, more specific characteristics, which, in the case of the Philippines, materializes in the visual lightness and transparency of the interiors, the fondness for ornament integrated into the structure, the color and richness of textures, the "space surrounded by space", or even in the typical steeply pitched roofs (Pérez III 1989). The bishops wanted the new Philippine churches to share all these notes. According to the document, new buildings for worship should consist of a single enclosure, with flowing and interrelated spaces that give priority to the place of assembly, with open atriums that enable the relationship between the faithful before and after the celebration, and in a festive atmosphere (Wendt 1998). Finally, they considered it important that churches harmonize with their surroundings and, at the same time, stand out as the most significant community building for communal gathering and worship ($ III 2.1).

At this point, I would like to highlight empirical evidence. Anyone who visits Manila and strolls through its barangays can easily come across small, latticed churches open to the four winds (Figure 1). Such elementary structures, which, at first glance, may seem to be an exception, are very common. The reason for this is that, in the Philippines, as in much of the Asia-Pacific area, churches and other similar buildings designed for human gatherings adopt passive strategies of climate control and therefore manifest themselves as semi-open spaces, to the point of constituting an invariant of architecture—in this case, religious. These kinds of local characteristics have the potential to become strong identity binders when communities become aware of them.

Figure 1. Open church in Taytay, Rizal, Metro Manila, 2012. Source: Author's archive.

3.2. Chapel of Cartwheels

In the mid-1980s, a strong cultural impulse emerged in Southeast Asia that sought to assert national identities and overcome Western colonizing influence. In our case, it was about creating a climatically appropriate architecture that ended up being called "tropical regionalism" (Cabalfin 2018a, 2018b). Indeed, already in the 1960s, unconventional religious buildings had begun to be seen, temples located in peripheral areas constructed with scarce means and much ingenuity, where the hand of skilled craftsmen could be detected, combining their lack of resources with their mastery of the trade—and even with good humor—to generate exciting spaces that resonated in the popular consciousness, gaining, at the same time, the respect and admiration of professionals.

The Chapel of Cartwheels was built early in that decade by the charismatic priest Guillermo "GG" Gastón at the Santa Rosalia Sugar Estate, which his family owned in Manapla, Negros Occidental. The chapel was built entirely with recycled materials, as an attempt to bring religion closer to the farmers who lived in the factory. Gastón recalled that, one day, the rubber wheels began to replace the wooden ones, which were kept to serve as fuel. In a stroke of inspiration, he thought of using the old wheels to design the chapel he had wanted to build for so long. He sought advice from his brother-in-law, architect Jerry Ascalon, who helped him with the technical details, and the result was a humble chapel that had a rough-hewn charm, almost as if it had been built by the workers themselves.

Beyond the spiritual meanings that Gastón wanted to give to the wheels used as an enclosure, the truth is that, in a climate as hot as that of Negros Occidental, these pieces work perfectly as lattices. In addition, the cover follows a formalization very similar to that of the salakot, the typical conical hat worn by farmers in the Philippine fields, and just like it, contributes to the diffusion of heat. All the pieces of furniture refer to the environment of the surrounding fields: a large stone slab is used as an altar, the benches are simple wooden planks, the decorations simple, and the flowers heliconia stems. Even the small windows of the presbytery were closed with pieces of broken bottles ingeniously arranged as stained glass windows.

The Chapel of Cartwheels belongs to its place and to the wind that blows through it. It gives the impression that it sprang from the earth, like the sugar canes that surround it; it is both impressive and comforting in its rustic majesty and has been celebrated as such (Pérez III 1994; Torres et al. 2018; Veneración 2012; Pacete 2017) (Figure 2).

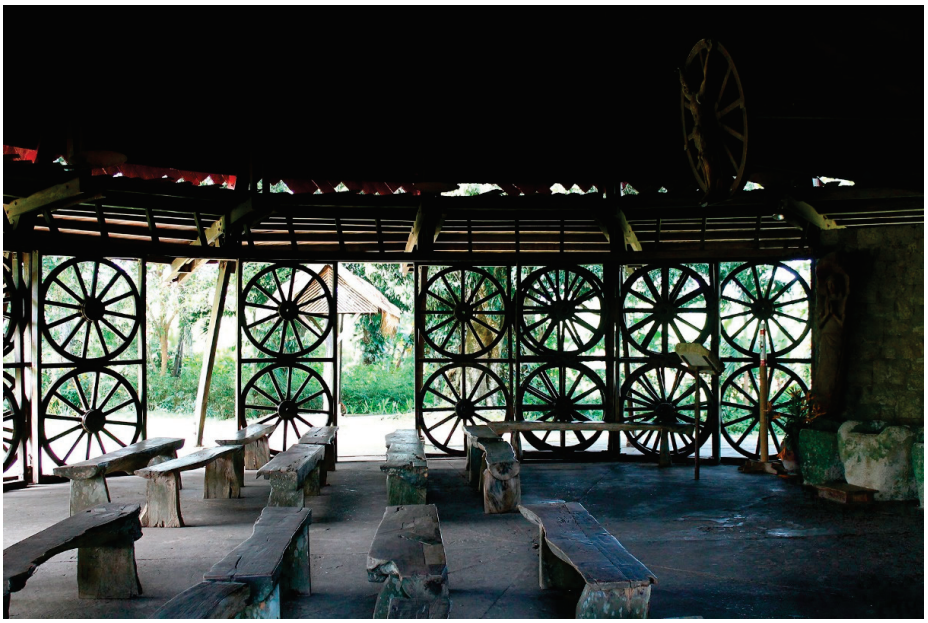

Figure 2. Guillermo "GG" Gastón and Jerry Ascalon, Chapel of Cartwheels, Hacienda Rosalia, Manapla, Negros Occidental, ca. 1960. Source: Elmer B. Domingo.

3.3. Greenbelt Chapel

In the large Philippine cities, there are small places of worship distributed homeopathically throughout the urban weave, chapels that are part of civil or religious institutions or private communities of faithful and that reflect the same climatic values that we have just seen. One of the most popular is the one dedicated to the Holy Child of Peace, located in the business center of Makati.

In 1977, after a trip to New York where she was diagnosed with terminal cancer, businesswoman Fanny del Rosario-Diploma conceived the idea of erecting a building for Catholic worship in the heart of the capital's financial district as an offering for her healing. In Manhattan, she had visited St. Patrick's Cathedral, laboriously emerging among the skyscrapers of banking corporations as a spiritual oasis, and she decided to build, in her own city, a chapel that could serve a similar purpose. She thought the expansive park at the Greenbelt shopping center in Legazpi Village would be the perfect site.

After some negotiations, she managed to get the Ayala Group to grant the Santo Niño de Paz Community—established for that purpose—the use of the site for thirty years, with the condition that nothing permanent would be built there. Since the chapel was to be temporary, architects Enrique "Jess" Dizón and Willie Fernández designed a 6 mm thick steel dome covered with wood. Should Grupo Ayala so decide, the chapel could easily be removed by helicopter.[1]

The space is quite remarkable. The industrial-looking lowered dome, supported on four points, encloses a central space which perimeter opens toward a small pond where ducks and colorful fish swim while, in the garden, several bronze pieces by the National Artist Napoleon Abueva—farmers working the land with their carabaos—add an ethnic touch to the ensemble. The church is always full, both on weekdays and holidays (31 masses are celebrated every week), and the community carries out a wide range of pastoral and welfare activities. The New York intuition of Mrs. Rosario-Diploma proved to be right; in fact, this was the first chapel to be built inside a shopping center, and it can be said that it was a trend-setter (Gálvez 2013; Gómez and Gilles 2014; Layug 2021; Graced, Grateful and Generous Stewardship at Greenbelt Chapel 2024) (Figure 3).

Figure 3. Willie Fernandez and Jess Dizon, Santo Niño de Paz Greenbelt Chapel, Legazpi Village, Makati, 1977–1983. Source: Author's archive.

3.4. Church of Mary Immaculate

Of all the open churches built in the Philippines in recent decades, perhaps the church of Mary Immaculate in Las Piñas has been the most applauded. The parish priest, Father Pierino Rogliardi, wanted to take advantage of the fact that the only available lot for the new church was surrounded by a mango plantation, so that the community could celebrate the Eucharist in communion with nature. Francisco "Bobby" Mañosa was able to materialize this novel intuition with the help of the landscaper Linggoy Alvarez.

Inaugurated in 1987, the Nature Church—as it is popularly known—presents an open architecture, without walls, doors, or windows, giving the impression that one is praying in the middle of a beautiful garden. Many elements evoke in the worshipper the presence of the wild nature of the islands. The altar table, for example, is a slab of coral marble with a rough finish resting on two cacahuananche wood pedestals picked from the seashore. Its anahaw roof—the largest in the archipelago until a fire forced its replacement with synthetic pieces—is formed by a network of intricately woven leaves, while a multitude of capiz lamps in the shape of spiraling pigeons provide warm, soft lighting at night. The pavement is a mixture of wood slabs and white pebbles, and the nave's benches are stumps from trees felled by a typhoon. The branches of an old Sampaloc tree support the image of the Crucified Christ, leaning protectively over the altar area.

In the rock garden, adorned with carabao grass, wild bougainvillea, pakpak lawin, and a collection of cultivated ferns and water lilies, an artificial waterfall cascades down to the feet of the seated image of St. Mary playing with the children and forms a small pond. Mango trees, palms, and other tropical plants serve as a backdrop to the Eucharistic sacrifice and provide privacy for prayer and meditation (Figure 4).

Figure 4. Francisco "Bobby" Mañosa and Linggoy Alvarez, Maria Immaculada (Nature Church), Moonwalk Subdivision, Las Piñas, 1986–1987. Source: Author's archive.

3.5. The Benedictine Monastery of the Transfiguration

The openness of the worship space understood in a broad sense has been an aspiration shared by the best Philippine architects of the second half of the 20th century. Starting from the Rule of St. Benedict, Leandro Locsin wanted to leave in the Benedictine monastery of the Transfiguration (1994–1996)—perhaps the most significant from an architectural

point of view among the hundreds of monasteries that currently exist in the country—his personal reading of what a monastery should be in the Philippine islands, both from the points of view of identity and climate.

The chapel is conceived as a celebration space protected by a sloping hipped roof that seems to levitate. This search for levitation—the transfiguration of matter, we could say—is clearly expressed by the position of the structural supports, which are located on the exterior and emerge from the ground, creating a sort of visual continuity with it.

The chapel coincides with the Nature Church in Las Piñas but also with other similar works, such as the Virgen Sang Barangay National Shrine (Chapel of Seashells) or the Immaculate Heart of Mary Church in Fairmount Hills, Rizal, not only in its link to traditional Filipino houses through its prototypical form but also in its intention to control the interior environment in a passive manner. Locsin had already incorporated vernacular spatial qualities in his previous projects; in this case, despite the use of modern materials, it is still possible to perceive some of the interior of the humble bahay kubo, reinterpreted in a contemporary manner, or perhaps of the ifugao huts found in the far north of the country.

The use of loose chairs instead of the usual continuous pews gives great flexibility of use to this church in the manner of spontaneous outdoor celebrations, while the circulation space running around the perimeter creates a transition zone that, in the monsoon season, can be enclosed with retractable glass partitions to protect from the wind. The architect used to repeat that the Filipino house is always "a space surrounded by space" and "a house that breathes". For, in the end, every church is nothing but God's house in the midst of his people (Girard 2018, 2021) (Figure 5).

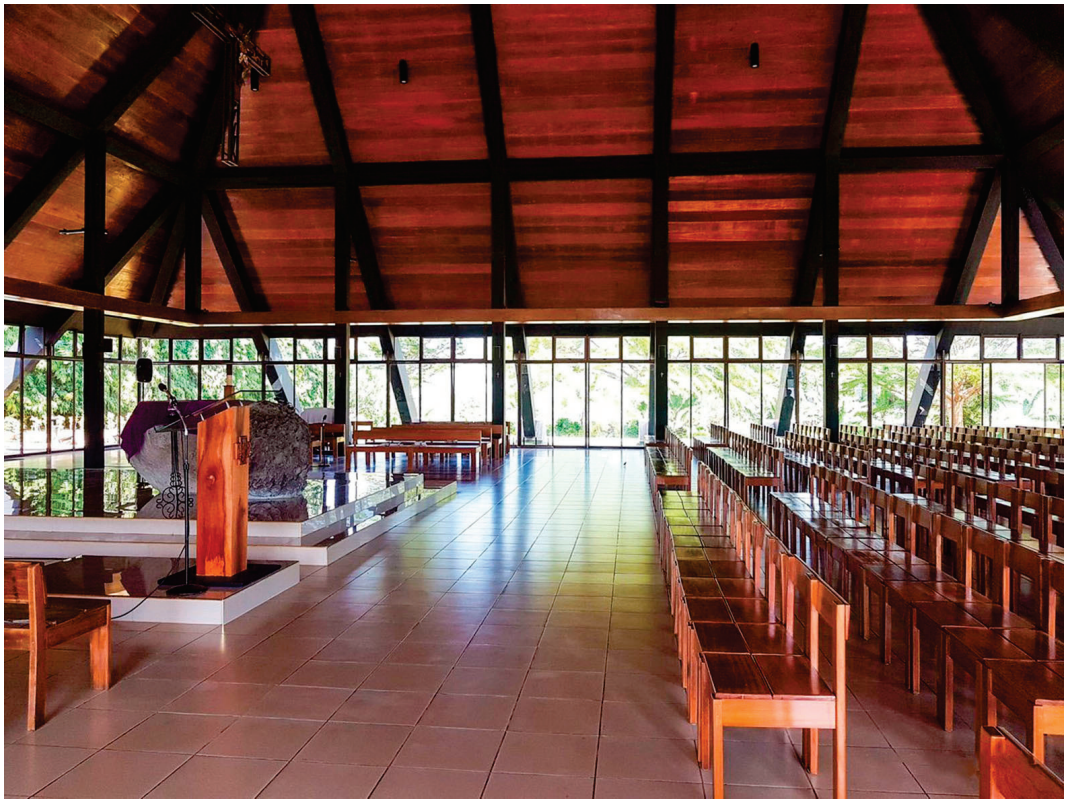

Figure 5. Leandro V. Locsin, Benedictine Monastery of the Transfiguration, Bukidnon, Malaybalay (Mindanao), 1994–1996. Source: Author's archive.

3.6. St. Mark's Open Chapel

With St Mark's Open Chapel (1974–1976), Locsin takes a further step in his search. This paradigmatic chapel, completely open to its surroundings, allows us to connect our

discourse with the provisional constructions made for the multitudinous ecclesiastical events that we will see below. In this case, it is a permanent construction, closely related to the boundary crosses or the typical crosses of the Atlantic regions of Europe, such as Ireland, Brittany, or Galicia. Sometimes, these constructions can also be seen in pilgrimage shrines, but they become permanent only in very mild climates.

The chapel is located in the middle of the lush forests of Mount Makiling (Los Baños, Laguna) at the entrance of the National Arts Center, an institution where young people can take courses in visual arts, theater, dance, or music while studying their regular high school subjects. Before reaching the top of the mountain, there is a small garden called Pook Bathala or Place of God, where a concrete cross partially covered with volcanic stone rises and in which mass the silhouette of the crucified Christ is cut out. The pillar supports a cantilevered rectangular slab capable of sheltering a hundred people from the rain and sun. The axis of the slab is open and lets light through a faceted glass cover, directing the view towards the small, somewhat naive image of the Holy Trinity.

Leandro Locsin designed this surprising structure in collaboration with National Artist Vicente Manansala, with whom he had already collaborated on previous occasions. The expressive power of concrete is softened by being in the midst of nature. The pebble pavement, the rustic stone benches with pots at the ends where ferns and other wild plants grow, or the altar, completely surrounded by native vegetation, incorporate vernacular nuances to the whole. Usually, the only acts of worship celebrated here are weddings and baptisms (Figure 6).

Figure 6. Leandro V. Locsin, San Marcos Open Chapel, Mount Makiling, Los Baños, Laguna, 1974–1976. Source: Julia Sumangil.

3.7. St. Josemaría Escrivá's Church: Praying from the Car

A very particular derivative of the opening of the Catholic worship space to its surroundings is given in the church of San Josemaría Escrivá, located in Tarlac (2010–2014). The building presents a typologically recognizable appearance, with a classic and careful language, but its most defining feature is its location, as it is located on the edge of a long straight road linking Girona with Carino. The fact that it is usually accessible by car means that the church has some novel aspects from a programmatic and symbolic point of view.

One of the most striking details of the exterior is the large bronze statue of a guardian angel in the corner of the bell tower, which welcomes pilgrims and offers to accompany them on life's journey (as St. Josemaría liked to remind us), but Alex O. Bautista, the architect, also thought that the faithful could visit the Blessed Sacrament even when the church was closed and without getting out of the car, so he arranged in the apse a small window that allows contemplating the drive-thru tabernacle while a presence sensor activates the lights of the church (Figure 7).

Figure 7. Alex O. Bautista, St. Josemaría Escrivá, Gerona, Tarlac, 2010–2014. Source: Author's archive.

4. Major Religious Events

4.1. Outdoor Worship

So far, we have seen how some permanent buildings show the open character of Christian worship celebrated in contact with nature, but it is above all the temporary buildings that manifest something that twentieth-century theology has been able to make us see that the world is no longer something cursed, "left out of God's hand", but a place redeemed by Christ, where the Christian can encounter the Creator in the midst of his daily occupations (Sáenz de Oiza 1952; Fernández-Cobián 2010).

After the Second Vatican Council, a change took place in Christian spirituality that directly affected the way in which liturgical spaces were designed. This mutation consisted of the passage from a fearful spirituality that saw the world as an enemy of religion to an optimistic one deployed in the environment and that understood the world as an opportunity

and a mission. The displacement of these theological concepts was immediately translated into a dematerialization of places of worship, especially those used in major ecclesial events. In this sense, the following consideration that, a few months after the closing of the Council and in the context of a multitudinous open-air Mass at the University of Navarre (Spain), it was made by its Grand Chancellor, St. Josemaría Escrivá, is architecturally very significant:

> Reflect for a moment on the framework of our Eucharist, of our thanksgiving: we find ourselves in a singular temple; it could be said that the nave is the university campus; the altarpiece, the university library; over there, the machinery that raises new buildings; and above, the sky of Navarre (. . .) I have constantly taught it with words of Holy Scripture: the world is not evil, because it has come from the hands of God, because it is his creature, because Yahweh looked at it and saw that it was good. (Escrivá de Balaguer 1969, p. 223)

In our specific case, the opening to the exterior of spaces for Catholic worship is not only a response to purely climatic issues but should also be understood as a sign of identity of the Filipino people, who do not limit themselves to celebrating their faith within the four walls of a temple but have historically used the public space for their religious manifestations and, therefore, as an area of communal affirmation of their national uniqueness.

4.2. Ecclesial Events Between the Wars

During the 20th century, the Philippines hosted many ecclesiastical gatherings that brought together hundreds of thousands, if not millions, of people in the same space. Evidently, there were no venues of such capacity in the country, and the public space, almost always urban, was the only option available. These gatherings are very intense moments that unite the faithful and create a feeling of collectivity and belonging in which the architecture itself—the orderly arrangement of people in that space—has something to say, regardless of the aesthetic language used at any given moment. We can recall the National Eucharistic Congresses (five between 1929 and 1997), the International Eucharistic Congresses (IEC) of 1937 and 2016, the solemn coronations and consecrations, and even the four papal visits that occurred between 1970 and 2015,[2] all events that required the construction of temporary architectures in the form of outdoor altars and their attached outbuildings.

The first of these took place in 1926. The coronation ceremony of the Blessed Virgin of Antipolo began with a fluvial procession along the Pasig River to the breakwaters of Manila Bay and the Luneta promenade, where the crowd recognized Mary Most Holy with the title of Our Lady of Peace and Good Voyage. This scheme—river procession and concentration at the Luneta—would be repeated on several occasions thereafter. News of the popular success of the Marian event spread throughout the Catholic world, to the point that chronicles suggest that the choice of Manila as the site of the 1937 International Eucharistic Congress may have been motivated by the enthusiasm shown by the Filipino faithful during those days.

In 1929, the first National Eucharistic Congress was held in Manila. Although the main events took place inside the cathedral, the Bishop of Tuguegarao, Constancio Jurgens, officiated an open-air Mass for the youth in the Luneta. The solemn procession of the Blessed Sacrament was attended by an estimated 100,000 people—after which, the consecration of the Filipino people to Christ the King took place (Mulry 1930; Rosales 1956) (Figure 8).

The XXXIII International Eucharistic Congress was held in Manila from 3 to 7 February 1937. It was the first to be held in Asia and constituted a very special moment of pride for the Philippines (at that time, a Commonwealth with the USA), since it somehow placed it on the world Catholic map. After thorough preparation, both spiritually and materially, the country welcomed 1.5 million Catholic pilgrims from all over the world. The congress included a night procession of 600,000 faithful, although the main events were held at the

Luneta, where Juan Felipe de Jesús Nakpil built an elaborate altar by placing the attendees in radial sectors arranged in a circle. He also designed the Eucharistic monument, a slender art deco structure composed of three supports topped by a circular beam and a dome that protected the Blessed Sacrament; the columns were decorated with human figures in prayer that served as stylized capitals (Daily 1937; Repetti 1937; Aubert 1965) (Figure 9).

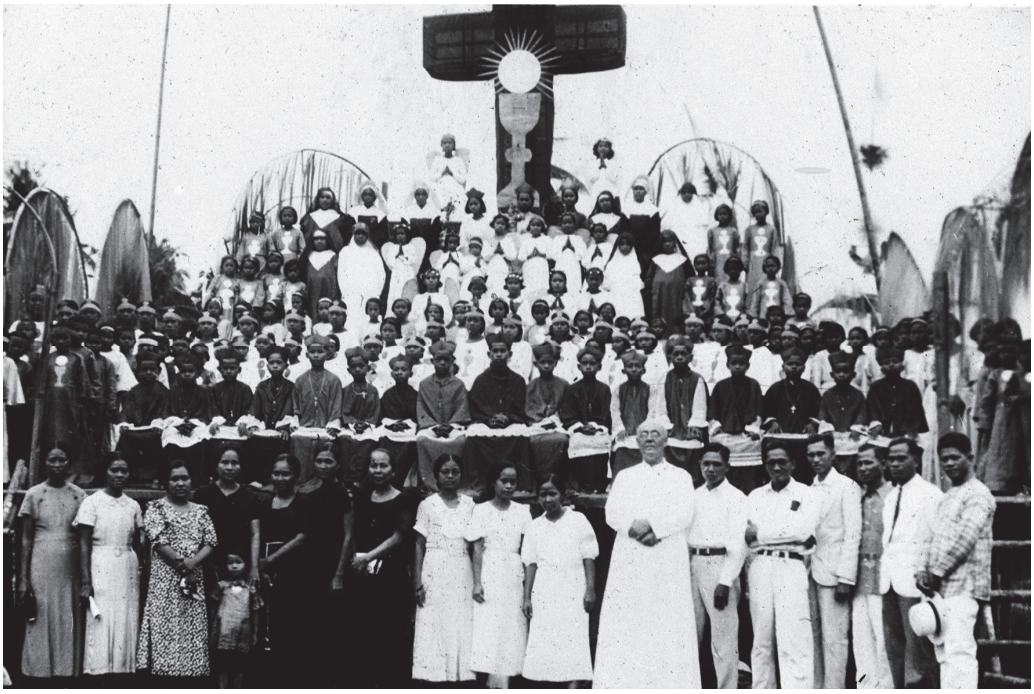

Figure 8. First National Eucharistic Congress, Manila, 1929. Source: Author's archive.

Figure 9. Juan Felipe de Jesus Nakpil, Altar of the XXXIII International Eucharistic Congress, Paseo de la Luneta, Manila, 1937. Source: Author's archive.

4.3. The Major Post-War Religious Events

During World War II, Manila was completely razed to the ground. In 1946, on the occasion of the commemorative events to celebrate the country's independence from the United States, architect Juan Arellano built the Quirino Grandstand on the promenade. Three years later, Federico Ilustre was commissioned to relocate it to the Luneta, now permanently and without some of the elements that ornamented the original structure. The building was completed just in time for the newly elected president Elpidio Quirino to inaugurate it. Since then, this long grandstand open to the large city esplanade has witnessed a multitude of events of all kinds, especially religious.

From an ecclesial point of view, the two decades between 1945 and 1965 were marked by the resistance of the Catholic Church to the anti-clericalism of Freemasonry, especially in matters related to education and customs. However, several events showed that religion continued to maintain a great strength in the country: the II National Marian Congress, Manila (1954), the creation in Rome of the Pontifical Collegio-Seminary Filippino (1959), and the celebration in Cebu of the fourth centenary of the Christianization of the Philippines (1965). Each of these events was supported by an architectural action.

The Second National Marian Congress was planned as a great public manifestation of the Catholic faith within the Marian Year that Pope Pius XII had convoked with universal character to celebrate the centenary of the proclamation of the dogma of the Immaculate Conception of Mary. On the last day of the congress (5 December), Cardinal Fernando Quiroga Palacios, Archbishop of Santiago de Compostela, celebrated a multitudinous Mass in the Luneta as papal legate for the event. He then blessed the first stone of the reconstruction works of the cathedral (Fernando Hizon Ocampo Sr., 1954–1958), as well as the Chapel of the Holy Guardian Angels at the Ateneo de Manila High School (Cesar Homero Concio, 1951–1956). The patriotic character of the event was enhanced by the procession of thirty-three images of Our Lady that arrived in Manila from various parts of the Philippines, attended by more than a million people. Pius XII addressed a colorful radio message to those present (Pius XII 1954), and after the blessing with the Blessed Sacrament, the president of the nation, Ramon Magsaysay, consecrated the Philippines to Mary Immaculate.

Taking advantage of the wake of the Marian Year, a Second National Eucharistic Congress (1956) was held a few months later. At the Santa Isabel College on Taft Avenue in Ermita, a huge neon sign, two meters long by four meters high, announced to Manileños the proximity of the event; above the letters was a large silhouette of the Sacred Heart outlined in red neon. Meanwhile, at the new Diliman campus of the University of the Philippines, Leandro Locsin and Chaplain John P. Delaney were struggling to finish the Holy Sacrifice Chapel on time (Zóbel de Ayala 1957).

The most significant event for our purposes, however, was the construction of the provisional altar that Juan Nakpil erected on the inevitable Paseo de la Luneta. Since it was not possible to establish the budget that was available—since the funds from parish donations called One-Peso Offerings would not begin to arrive until after the event—the architect had to take advantage of the Quirino Grandstand and, with the limited means at his disposal, add an altar where he could accommodate all the members of the Philippine ecclesiastical hierarchy, plus the visiting dignitaries, the Cardinal Legate and his entourage and the president of the nation. In its final form, the altar was marked by a huge figure of Jesus Christ with his heart exposed. Although the surviving images do not allow us to appreciate the details, according to the chronicles of the time, "Nakpil and the contractor Mariano Sideco were able to satisfy all the liturgical requirements, and the altar, built at minimal cost, was an inspiring spectacle" (Verceles 1957, p. 466) (Figure 10).

As a token of Spain's closeness to the Philippines, General Francisco Franco offered as a gift the Eucharistic monstrance that was used in the closing procession, which was

attended by more than a million faithful. At the end, Pope Pius XII was heard through the loudspeakers imparting his blessing:

> You have transformed your Luneta, so to speak, into a vast living ostensory, and Manila Bay resounds with the perennial plea of Mother Church to her divine Founder and Sustainer: O Victim, who has saved us and reopened the gate of Heaven, the struggle is fierce: be thou our strength, grant us thy help! (Cullum 1957)

On the same day, 2 December 1956, President Ramon Magsaysay consecrated the Filipino people to the Sacred Heart of Jesus.

Figure 10. Juan Felipe de Jesus Nakpil, Altar of the II National Eucharistic Congress, Manila, 1956. Source: Verceles 1957.

4.4. Papal Visits

Fourteen years later, a pope landed in the Philippines on 27 November 1970. The enthusiasm of the Filipinos was overwhelming. During his three-day stay on "Pinoy" soil as part of a pilgrimage to East Asia, Oceania, and Australia (25 November–5 December 1970), Paul VI visited a good part of the islands and was even the target of a failed assassination attempt. In addition to numerous mass meetings, on the 28th, he celebrated Mass at the old Luneta Promenade, which, in 1967, had been renamed Rizal Park, and the following day, another Mass at the Quezon Memorial Circle. I have not been able to find out the name of the architect who was in charge of building the papal altars, which are markedly classical in style (Paul VI 1970; Vatican News 2020) (Figure 11).

John Paul II traveled to the Philippines twice. The first time was in February 1981 as part of his first pastoral visit to the Far East.[3] The Supreme Pontiff made a very complete tour of the country, and in addition to Manila, he visited Cebu, Davao, Bacolod, Iloilo, Legazpi, Baguio, and Morong. The pope officiated his first mass on Philippine soil at the Metropolitan Cathedral of Manila, but the central event of the trip was the beatification of Lorenzo Ruiz and his fellow martyrs, who had been killed in Japan during the persecutions of the 17th century. It was an unusual event, as it was the first beatification to take place far from the Vatican. The design of the altar in Rizal Park was the work of José María Zaragoza, while Bobby Mañosa designed an ethnic processional carriage to replace the then customary armored popemobile. Years later, Mañosa would have the opportunity to create

the spectacular spire that served as the stage for the IV National Eucharistic Congress of 1987 (Caruncho 2003) (Figures 12 and 13).

Figure 11. Pope Paul VI at the University of Santo Tomas, Manila, 1970. Source: John Paul "Lakan" Olivares.

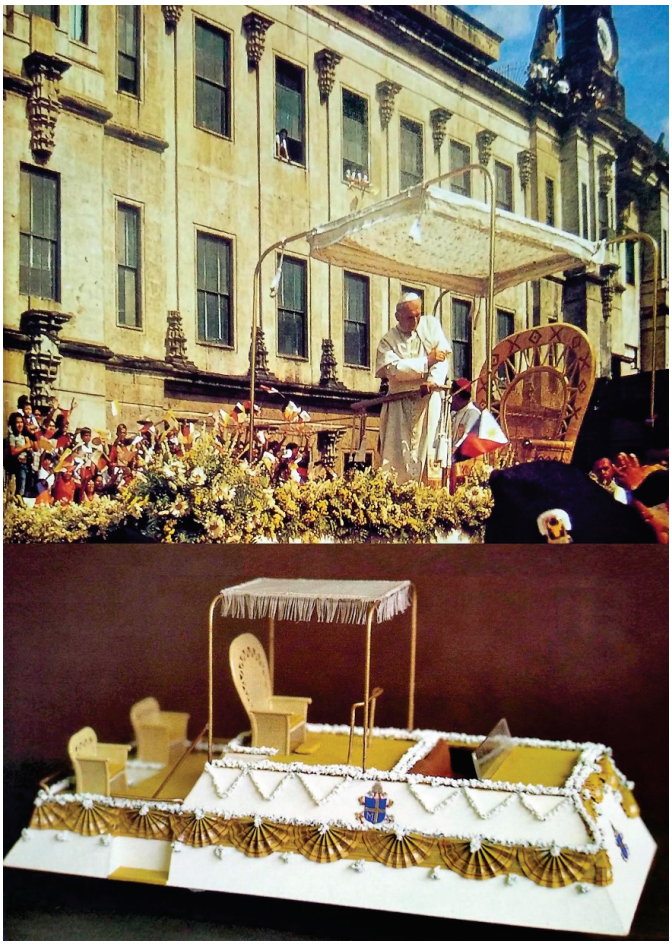

Figure 12. Francisco "Bobby" Mañosa, traditional Filipino carriage for Pope John Paul II, Manila, 1981. Source: Caruncho 2003.

Figure 13. Francisco "Bobby" Mañosa, altar for the 4th National Eucharistic Congress, Manila, 1987; announcing poster. Source: Patrick Kasingsing (Cruz 2024).

John Paul II visited the country again on the occasion of the 10th World Youth Day (Manila, 10–15 January 1995). Once again, it was Bobby Mañosa who was in charge of designing the altar attached to the Quirino Grandstand for the closing Mass held at Rizal Park—up to that date, the largest human concentration in history, gathering some 6 million people (Figure 14). This was the Polish pope's last stay in the Philippines, as his scheduled trip for the 2003 World Meeting of Families was cancelled due to an advanced stage of Parkinson's disease from which he was suffering.

Figure 14. World Youth Day, Rizal Park, Manila, 1995. Source: Author's archive.

On 30 November 2012, the National Mass of Thanksgiving for the canonization of St. Peter Calungsod, who, a few days earlier, had been raised to the altars by Benedict XVI in St. Peter's Basilica in Rome, was held in Cebu City.[4] The ceremony was attended by thousands of people, including the President of the Republic, Benigno Aquino III. The ceremony began with a fluvial procession; then, the image of the new saint was carried to the colorful baldachin that the architect Ramon Vios had built for the occasion. The event lasted well into the night, and according to the chronicles of the time, the festive and vibrant architectural illumination not only enhanced the Eucharistic celebration but also served to pay homage to the country's second native saint (Figure 15).

Figure 15. Ramon Vios, altar for the National Mass of Thanksgiving for the canonization of St. Peter Calungsod, Cebu City, 2012. Source: Author's archive.

Twenty years after the last stay of John Paul II, Pope Francis traveled to the islands. On 16 January 2015, he celebrated Mass in the Manila Cathedral, which, between 2012 and 2014, had been closed while some works were undertaken to prevent future earthquakes. On the 18th, seven million faithful attended the Eucharist in Rizal Park, where architect and priest Alex O. Bautista had once again intervened in the Quirino Tribune (Figure 16).

To date, the last major ecclesial event to be held in the Philippines was the 51st International Eucharistic Congress (Cebu, 24–31 January 2016). The opening ceremony was attended by nearly one million people and used the same abstract baldachin that, four years earlier, had hosted the canonization of St. Peter Calungsod. The most impressive episode was the evening candlelight procession, in which two million people walked from the Provincial Capital to Independence Square—around five kilometers—adoring the Blessed Sacrament exposed in a magnificent Eucharistic monstrance (Figure 17).

Figure 16. Ignacio Arellano and Federico Ilustre, Quirino Grandstand (Paseo de la Luneta/Rizal Park), 1946–1949. Intervention by Alex O. Bautista for the visit of Pope Francis, 2015. Source: Author's archive.

Figure 17. Procession during the 51st International Eucharistic Congress, Cebu City, 2016. Source: Author's archive.

5. EDSA Shrine: Architecture as a Civic and Religious Space

Before concluding, I would like to refer to the role that open architecture can play as a civic and religious space at the same time, which, in the Philippines, is embodied in the unique shrine of Our Lady of Peace. Designed by Francisco "Bobby" Mañosa in 1986 and completed posthumously in 2021, the also called EDSA Shrine is located at one of the

corners of the complex road junction formed by EDSA and Ortigas Avenues and which strategic location makes it a popular urban landmark. It was a commemorative monument that marked the beginning of the democratic era in the Philippines, a civic–religious shrine that reminds Filipinos of the intercession of Our Lady so that the citizen revolution that ousted Ferdinand Marcos from power would take place in a peaceful manner, and a symbolic building that evidences an intense civic vocation and, ultimately, the Filipino people's desire to link religion with public space.

Mañosa's first version for the memorial showed an enclosed basilica with the appearance of a large bahay kubo, with seven sloping, clustered roofs framing a statue of the Virgin resting on the ground (Figure 18). But this first project was not to the liking of the managing committee, so the architect proposed as an alternative a "town square", an architectural promenade with Mary as the focal point, completed with a subway space dedicated to worship. Finally, the project was configured as a podium formed by three oblong hexagonal enclosures that house a small church that serves as a base for the sculpture (Mañosa 2017).

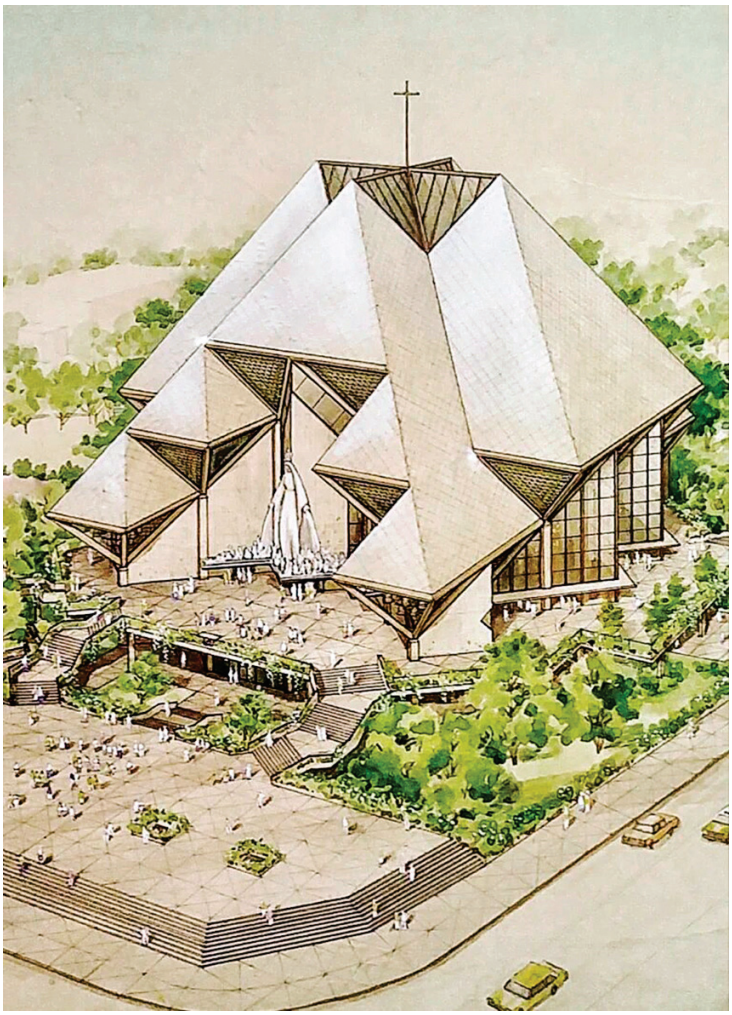

Figure 18. Francisco "Bobby" Mañosa, first proposal for the Our Lady of Peace Shrine (EDSA Shrine), Quezon City, 1986. Source: Patrick Kasingsing (Cruz 2024).

Several events surrounded the construction of this building. Perhaps the strangest was the entrenchment of a group of soldiers who made themselves strongholds there during the attempted coup d'état in November 1989, a few days before its inauguration. When they surrendered a week later, the sanctuary could be consecrated amidst the grim aftermath of the coup.

In addition to serving as a meeting point for various citizen demonstrations, every year, a mass Eucharist is held in its atrium to commemorate the People Power Revolution, among the various works of art that symbolize the spirit of freedom and peace of the Philippine nation. At one end is the Flame of Freedom, a sculpture by Manny Casal depicting three men carrying a cauldron on their shoulders, while scattered around the town square are the fourteen Stations of the Cross, cast in bronze by Napoleon Abueva. The sanctuary is presided over by a monumental image of Our Lady, Queen of Peace (Virginia Ty-Navarro), which, although it has an undoubted urban presence, is unable to compete with the lure of the large billboards behind it. In 2019, the ensemble was declared Important Cultural Property (Figures 19 and 20).

Figure 19. Francisco "Bobby" Mañosa, Shrine of Our Lady of Peace (EDSA Shrine), Quezon City, 1986–2021. Source: Jon Raz.

Figure 20. Anti-corruption protests against the Joseph Estrada administration in front of the Shrine of Our Lady of Peace, Quezon City, 2001. Source: Author's archive.

6. Results

We have seen how different types of religious architecture, very different from each other, share a common characteristic: their openness to the outside. The examples presented here do not in any way imply that there are no completely closed churches in the Philippines; security or environmental reasons may make this advisable. Consider, for example, the case of Baguio City, the summer capital built by the Americans at the beginning of the 20th century because of its cooler climate than Manila.

The resources that Filipino architects have used to achieve this openness are varied. First, a confined space can be conceived as conceptually open, as if it were a cage or an aviary; this is the case of the anonymous church in Taytay or the Chapel of Cartwheels in Manapla. It can also be a space that is only partially enclosed, with wide openings that are well designed to generate air flows, as in Greenbelt or the Monastery of the Transfiguration, or just simple visual openings, as in Gerona. In the most extreme cases (Nature Church or St. Mark's), the architect barely encloses the space with a roof, as if it were a communal sakalot that protects from the sun but allows nature—the air, the plants, the remains of the tides thrown on the beach—to freely form part of the divine worship.

Logically, everything is pushed to the limit at major religious events. In these events, openness is a basic requirement, and the architect must make a virtue out of necessity, but in the case of the Philippines, the very high participation of the faithful in them allows us to suspect that the exterior configuration of the worship space responds to the Pinoy way of living religiosity. The Shrine of Our Lady of Peace (EDSA Shrine) would then seem to be the permanent materialization of this community spirit.

Throughout our tour—provocatively and poetically called "cartography"—we have been able to detect an intense vindictive aroma: the aspiration for a regional—we could even say national—architecture, in which the communion of interior space with the exterior environment emerges as something proper to the Filipino character, almost as a vital necessity, and so it seems to emerge from some of Bobby Mañosa's statements or from the CBCP document (1999).

7. Conclusions

Any architecture is always the result of a complex interaction between the natural conditions of a country and the way of life of its people. The territory imposes its geography and climate and the people their history and customs. In the case of the Philippines, its insularity and location within the Pacific Ring of Fire has made any form of construction a continuous struggle against high temperatures, typhoons, volcanoes, and earthquakes. This situation of chronic vulnerability has conditioned the architecture of the islands, generating community buildings that are usually compact and massive but always ventilated. At the same time—perhaps as a strategy to ward off fear—the interiors are filled with color by means of plastic applications, which degree of quality depends on the cultural level of the clients, ranging from the usual naive or kitsch decorations to the interventions of great national artists.

The characteristics of the country and its people—simplicity, cheerfulness, resilience, religiosity, etc.—are reflected in the architecture intended for Catholic worship, whether permanent or temporary, giving it unique qualities. Filipino people enjoy living outdoors, so even religious buildings are never totally enclosed, often opening up to the landscape and seeking contact with nature, but they also like to manifest their faith in public. Perhaps that is why the large church events held on the islands over the past few decades have been among the largest in history.

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Notes

1 On 13 December 2012, upon the expiration of the stipulated term, Ayala Land Inc. decided to keep the chapel in its current location, handing over its management to the Archdiocese of Manila.

2 About the papal visits, Cardinal Angelo Sodano recalled "They were immensely joyous moments, when the Filipino people turned out in great numbers to show their affection and esteem for the Holy Father. How can we forget the five million people who came to greet Pope John Paul II at the World Youth Day in Manila in 1995? It was a truly impressive occasion, the largest gathering for a papal event in the history of the Church" (Sodano 2001).

3 It should be recalled that, as a precondition, the pope demanded Ferdinand Marcos to withdraw martial law, and he did. He also refused to stay at the Coconut Palace, built by Bobby Mañosa for the occasion, considering it too luxurious. Cardinal Wojtyla had already visited Manila in 1973, on his way to the XL International Eucharistic Congress held in Melbourne (Australia).

4 Pedro Calungsod, a missionary in Guam, was killed in 1672 by the Chamorro Chief Mata'pangfue; he was eighteen years old.

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The Sacred Architecture of Josep Lluís Sert

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Abstract: An unknown aspect of Josep Lluís Sert (Barcelona, 1902–1983) is his deep engagement with Christian spirituality, particularly following his American exile. This perspective is beautifully reflected in his religious-themed projects, among which historiography has highlighted the church of Puerto Ordaz (Venezuela, 1951), the Chapel of St. Botolph (Boston, 1963–1968), and the Carmel de la Paix Chapel (Mazille, 1967–1972), designed, respectively, before, during, and after the Second Vatican Council. Using these three well-known projects as a starting point, our aim is to expand the discussion around this topic to encompass the entirety of Sert's sacred architecture. The contributions of Sert to the design of modern religious architecture are analyzed in this study, firstly through the distinctive aspects of his architecture, such as its urban scale and interactions between various plastic arts, and secondly through his theological references. This study is based on Sert's original drawings, as well as specific bibliographic sources and articles from specialized journals. At the same time, it seeks to highlight an aspect of the architect that, despite the significance and brilliance of his designs, has received little attention until now.

Keywords: Sert; sacred architecture; liturgical reform; modernism

1. Introduction

José Luis Sert (1902–1983) is considered to be one of the pioneers of modern architecture in Spain. Through the GATCPAC, the Catalan section of the Group of Spanish Architects and Technicians for the Progress of Contemporary Architecture, and the AC magazine promoted by the group, he maintained contact with the European and global architectural avant-garde, eventually presiding over the International Congresses of Modern Architecture (CIAM) from 1947 to 1956.

Exiled from Spain after the Civil War, Sert developed his professional activity in the United States. He first settled in New York, where he primarily worked on urban projects for Latin American cities. Later, he moved to Cambridge, MA, to direct the Harvard Graduate School of Design, where he practiced under Sert, Jackson, and Associates. In 1981, he was awarded the AIA Gold Medal.

Like GATCPAC, Sert was strongly linked to the ideals of the Republic. Among other examples, Sert, together with Luis Lacasa, designed the Spanish Pavilion for the Republic at the 1937 International Exposition in Paris, for which Picasso painted *Guernica*.

The government of the Second Spanish Republic did not have particularly good relations with the Catholic Church, and Sert, coming from an aristocratic and Catholic family, distanced himself somewhat from the institution. It was not until his exile in the United States that the Catalan architect reconsidered his beliefs regarding the faith he had received as a child, finding within it a space that did not require him to abandon his social and political ideals.

In her biography of Sert, María del Mar Arnús, the Catalan architect's niece-in-law, writes the following:

> "*(. . .) his Catholic faith was strengthened, though based on the premises of the theologian Teilhard de Chardin, whose works he owned in their entirety. His book Building the Earth had deeply impressed him. I remember discussing it with him on occasion. A strong religious sense, nurtured by his mother, resurged fervently. He attended Mass on Sundays with Moncha, who had always been a devout practitioner, and his daughter María Paz.*" (Arnús 2019, p. 209)

There is further evidence of Sert's religiosity. Oriol Bohigas, in his published memoirs, highlights the relationship between the architect and the Catalan theologian Raimon Panikkar (as does Arnús in her previously mentioned work), as well as with the Capuchin friar Mn. Llimona, whom he describes as Sert's spiritual director upon his return from exile (Bohigas 2014, p. 529). J. K. Birksted, in his book on the Carmel de la Paix, cites several accounts of the Catalan architect's religiosity, including those of Jack Williams (a former collaborator of Sert in his Cambridge studio), Mother Marie-Thérèse (prioress of the convent), and John P. Boles (auxiliary bishop of Boston) (Birksted 2013, pp. 28, 67).

The complete works of Sert, published by the Miró Foundation (Sert et al. 2005), include three religious buildings: the Church of Puerto Ordaz (1951), the Chapel of St. Botolph (1963–1968) (Table 1), and the Carmel de la Paix Convent (1967–1972) (Table 1), the only one of the three to be built. Using these three works, recognized by historiography, as a starting point, the aim of this article is to encompass the entirety of Sert's sacred architecture, much of which was never realized. By analyzing their common characteristics, the goal is to enable further in-depth studies of each work through more specific analyses.

The church project for Ciudad Piar and Puerto Ordaz (Figure 1) was published in 1953 in *Architectural Record* (Sert and Wiener 1953) and *Liturgical Arts* (Sert 1953)—the most comprehensive text written by Sert on religious architecture—and later in *Chiesa e Quartiere* in 1958 (Longhi 2015, pp. 30, 31). It also features prominently in the key monographs on Sert (Bastlund 1967; Freixa 1997; Sert et al. 2005).

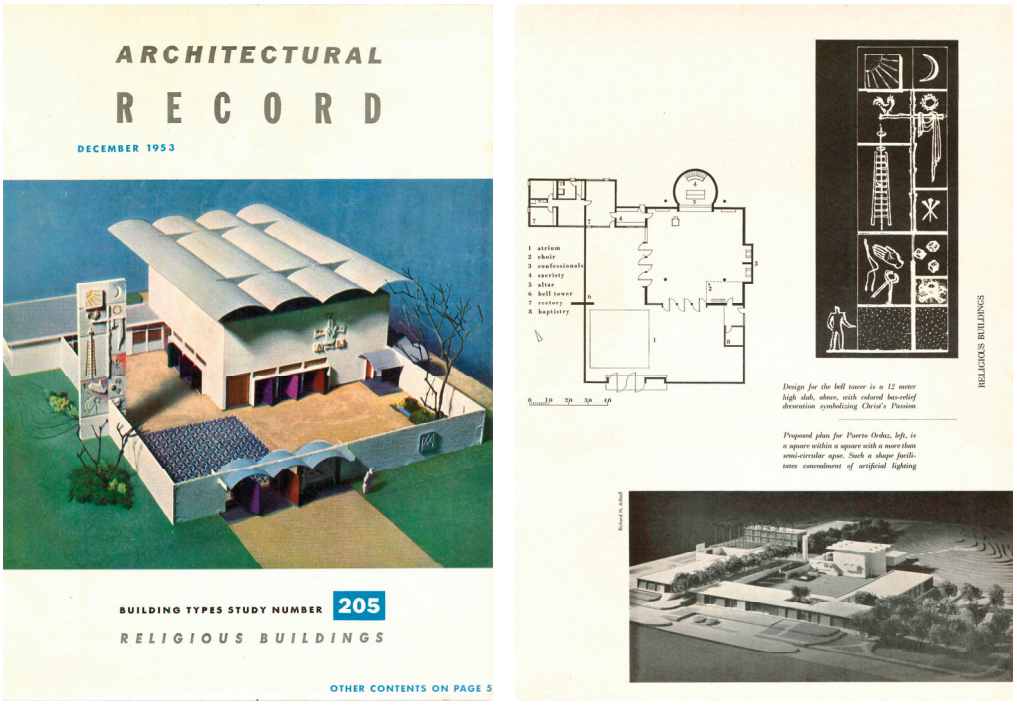


Figure 1. The Church of Ciudad Piar and Puerto Ordaz in the cover and pages of 1953, *Architectural Record*, vol. 114, nº 6.

This church represents the final episode in a series of chapels included in all the projects by Town Planning Associates (TPA, Sert's office with his American partners in New York) for various cities in Latin American countries. These can be found in the Sert and Wiener archives, as well as in numerous publications, such as issue 33 of *L'Architecture d'Aujourd'hui* (Wiener and Sert 1950). As Freixa states in his monograph:

> *"[. . .] the preliminary designs included written and graphic materials. Notably, there was an emphasis on visual presentation, always in terms of design.*
>
> *The approval of the pilot plan was always the subject of serious debates, but once accepted, it provided the planners with a solid foundation for the development of the master plan. This plan focused on the remodeling or creation of entire urban segments, in detail, bringing its level of definition to an almost architectural scale."* (Freixa 1997, p. 57)

These are buildings predating the liturgical reform of the Second Vatican Council. However, in all of them, the concerns outlined by Sert in his "Nine Points on Monumentality" (Sert et al. 1943) are evident, in addition to responding to his ideas and, more generally, those of the CIAM on the modern city (Sert 1942; Tyrwhitt et al. 1952).

In the case of the church for the Boston Government Center, dedicated to St. Botolph (Figure 2), the situation is entirely different. It builds on the experience of the previous churches (the projects for Latin America, especially the last typology designed for Ciudad Piar and Puerto Ordaz), but at a different moment in the liturgical development: although it predates the General Instruction of the Roman Missal (GIRM), it is after *Sacrosanctum Concilium* and therefore already open to the reforms of the liturgical movement.

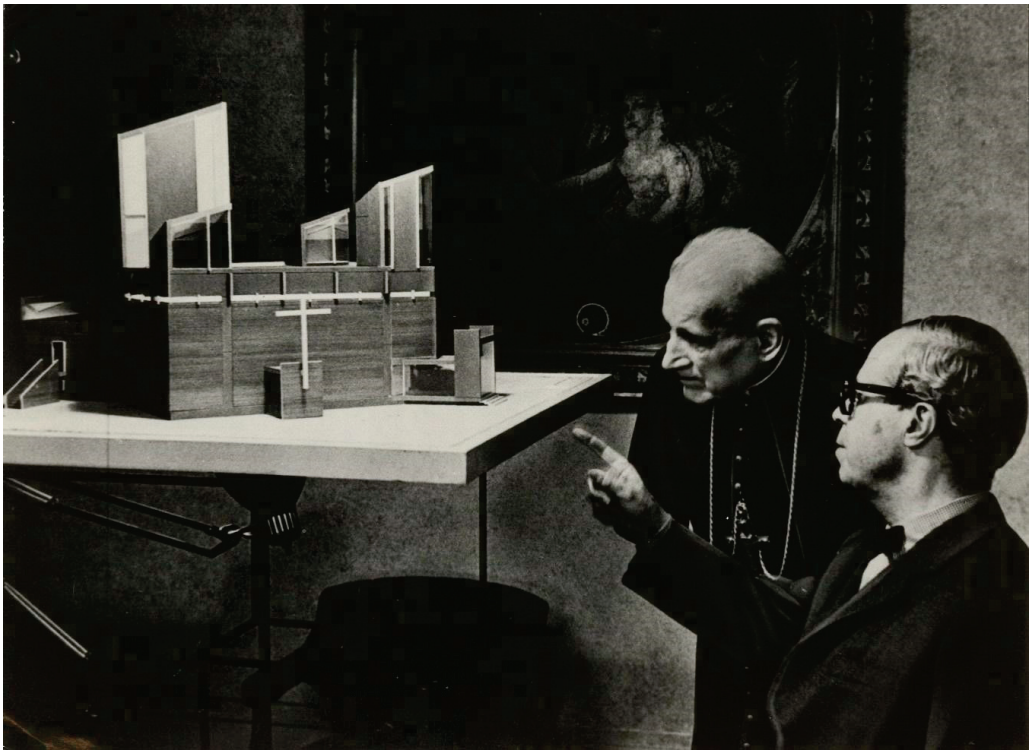


Figure 2. Josep Lluis Sert showing St. Botolph's model to Cardinal Cushing (1963). Courtesy of the Frances Loeb Library, Harvard Graduate School of Design (GSD).

In this project, the entry of natural light will be fundamental, and it will be tasked with highlighting the color accents on the white walls characteristic of Sert's architecture through the stained glass windows of the skylights. This strategy, widely explored in Gothic architecture, had already been tested by the Catalan architect in the Chapel of

St. Bernard at the Maeght Foundation (Birksted 2004, pp. 78–79). For the design of the skylights, he would also draw on a resource derived from his knowledge of architectural history, specifically the *Transparente* of the Toledo Cathedral (Figure 3).

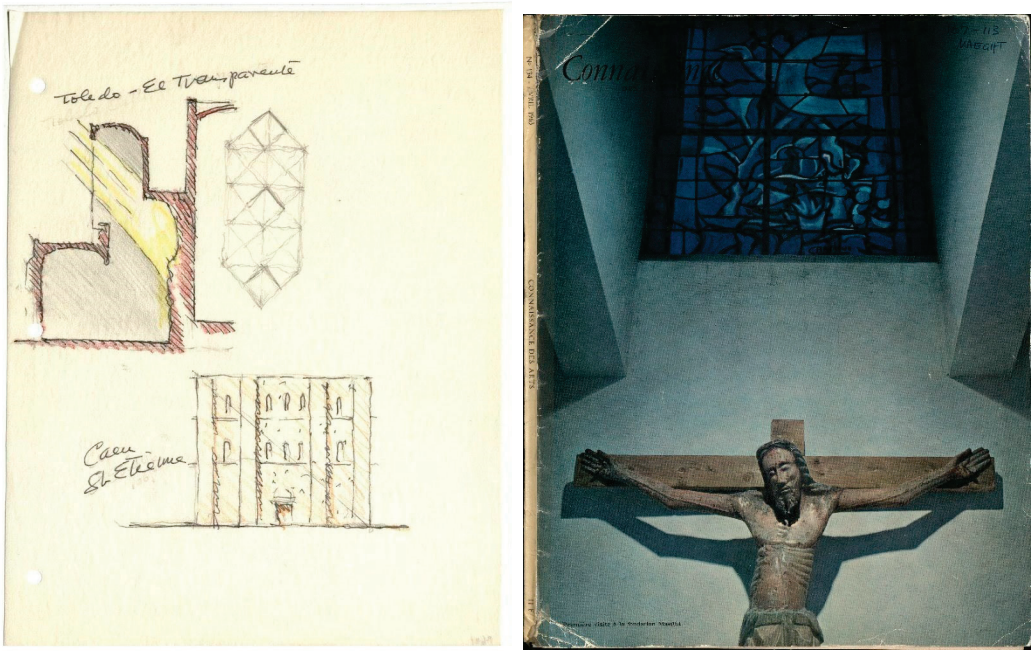


Figure 3. Drawings by Sert with references for the Chapel of St. Botolph (**left**); skylight of the Chapel of St. Bernard on the cover of *Connaissance des Arts* (1963) (**right**). Courtesy of the Frances Loeb Library, Harvard GSD.

The chapel dedicated to St. Botolph was published in *Liturgical Arts* in 1967 (Sert, Jackson, and Associates 1967) and in *Architectural Forum* in 1965 (Sert and Karas 1965), as well as in the key monographs on Sert's work.

Finally, when the project for the church at the Boston Government Center was nearing completion, the last religious-themed work arrived at the studio: a Carmelite convent in Mezille, France (Figure 4). This project is widely published, not only in monographs on Sert's complete works, but also in specific editions of the project, particularly following its restoration (Héritier 2008; Birksted 2013; Brulé et al. 2020). After an initial version of the convent following the typical scheme of a building around a cloister with a rectangular-plan church, clearly referencing the nearby La Tourette convent, the design soon shifted to a pavilion-based layout for the cells, with a main building at the entrance that includes the chapel.

In the Carmel de la Paix, the space intended for the chancel became the chapel itself. The design is completed simply with the entry of skylight and color accents on the white walls through two stained glass windows.

This central plan element, which can be expanded or not by a main nave depending on the seating capacity requirements, along with the skylight and color accents on the white walls, are constants in Sert's sacred architecture, in addition to the always prominent presence of the crucifix, a figurative reference within the space.

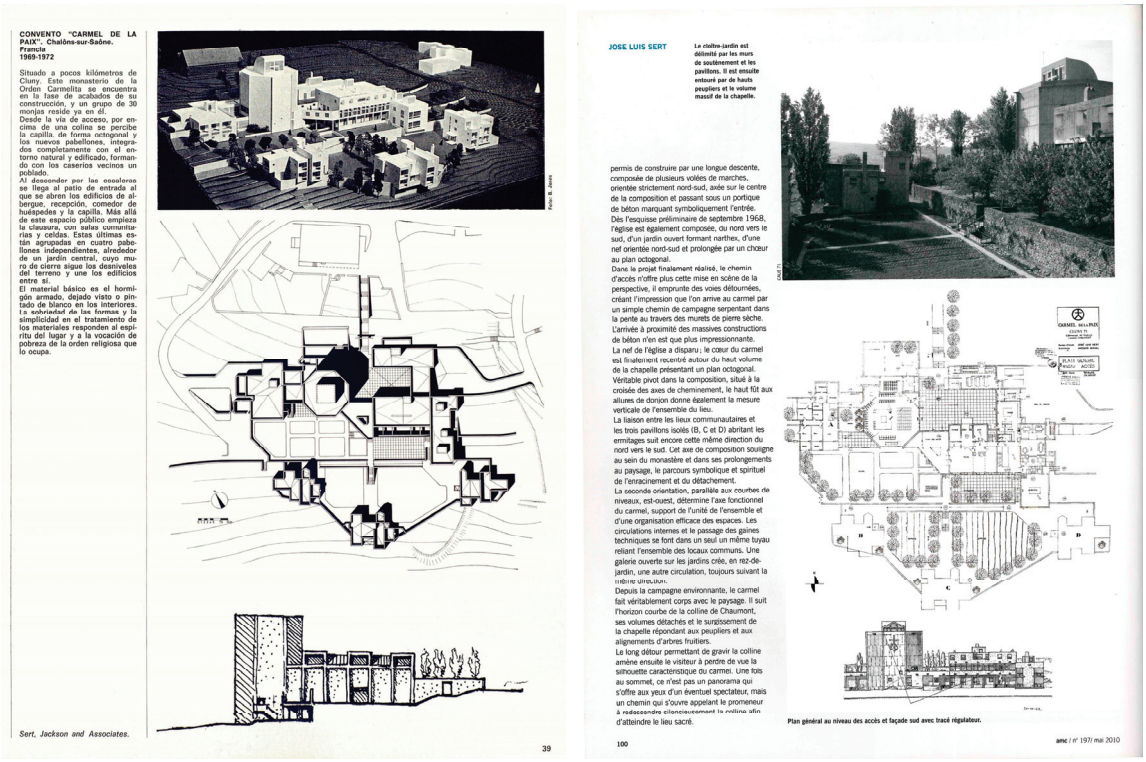


Figure 4. The Carmel de la Paix was published in issue 93 of *Cuadernos de Arquitectura y Urbanismo* (1972) and in issue 197 of *Le Moniteur Architecture* (2010).

2. Results, Materials, and Methods

Based on the materials found in the bibliography, archives, and visits to the built works, our aim is to analyze the evolution of all Sert's sacred architecture projects, which will be presented as the results of our research in this section. Later, in the Discussion, these projects will be contrasted with the architectural theory developed by Sert in his writings and lectures, as well as with the theological sources that may have influenced him.

Regarding the bibliography, in addition to the previously cited titles, we highlight: (Rovira 2000; Costa and Hartray 1997; Sert et al. 1979; Tarchópulos Sierra 2022; Wasson-Tucker 1947; Bujosa Rodríguez 2014). As for the archives, we mainly highlight the Sert Collection at the Frances Loeb Library, consulted during stays in the last two weeks of August 2023 and 2024, although materials from the Wiener archive, COAC, and the Miró Foundation were also consulted. Regarding visits to the built works, these were carried out in January 2024 (with respect to chapels, only the Maeght Foundation chapel and the Carmel de la Paix chapel were built, both in France).

In light of these materials, we can also define at least two phases in Sert's sacred architecture, which coincide with his two offices in the United States. During the years in New York, church designs were developed as part of urban plans for Latin American cities commissioned to the TPA. In the years during his office in Cambridge (Sert, Jackson, and Associates), the designs for the Chapel of St. Bernard for the Maeght Foundation, the Chapel of St. Botolph for the Boston Government Center, and the Chapel of Carmel de la Paix in Mazille were created.

2.1. Churches Designed by the Town Planning Associates

The church typology developed in the urban projects of the TPA underwent an evolution. The case of *Cidade dos Motores* (1944–1946) (Table 1) represents an initial attempt, somewhat naive and ill-defined, at approaching the type of sacred building that, starting

with the second project, that of Chimbote, will establish a pattern that evolved through a back-and-forth process, eventually leading to the more consolidated typology seen in Ciudad Piar and Puerto Ordaz.

In any case, the most consistent elements in the churches designed by the TPA—the bell tower and the structure of columns supporting a roof that allows for light to enter (thus freeing the enclosures from this function, which can be blind, always without openings)—are already present in the *Cidade dos Motores* project (Figure 5).

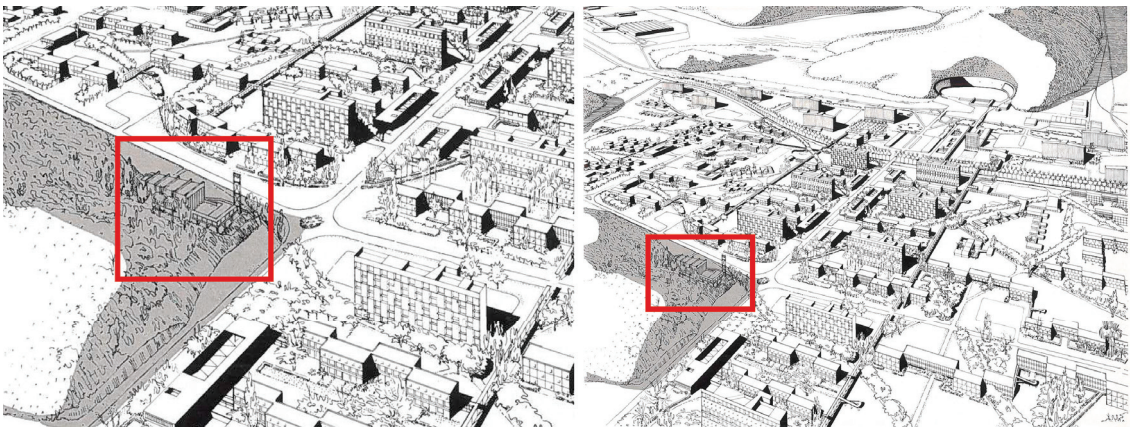


Figure 5. General view of the Urban Proposal for *Cidade Dos Motores* and close-up view of the Church. The red box highlights the church. Image from *Cuadernos de Arquitectura y Urbanismo*, nº 93, p. 6. (1972).

In the first and more defined design, that of Chimbote (1946–1950) (Table 1), an attempt is already evident to distinguish the area of the chancel from the rest of the nave, both in the design of the civic center or cathedral church and in those of the less prominent ones. The walls would be curved in all cases, but whereas in the nave they create deep directional lines, in the chancel area they form a kind of semicircular closure. It is noteworthy that, despite being churches predating the liturgical reform, there is a clear intention to separate the altar from the walls of the chancel, placing it at the center of the sacred space. The bell tower takes the form of a totem or monolith in a T-shaped plan. The baptistery is located at the entrance of the central nave, defined by a greater curvature of the wall at the corner of the nave (Figure 6).

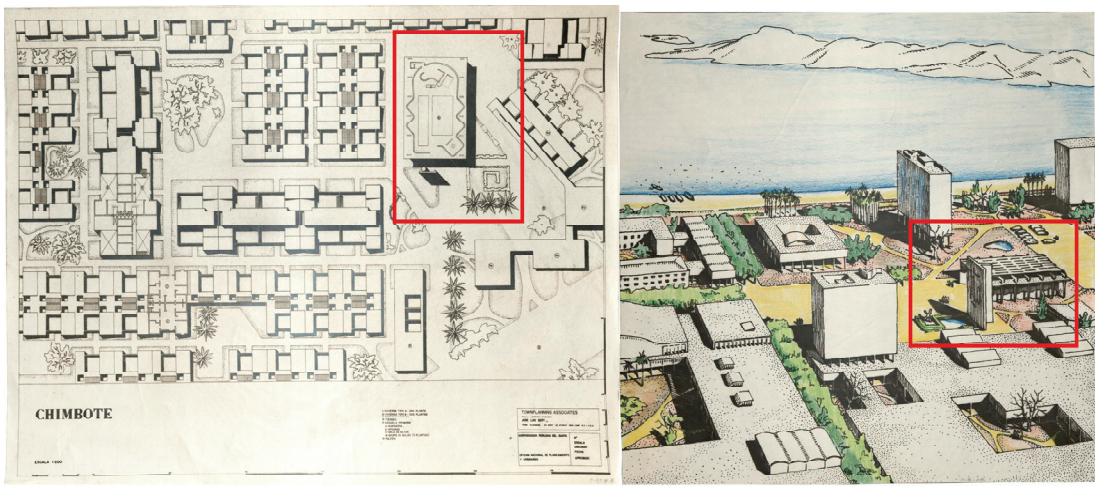


Figure 6. (1948) Plan and aerial view of Chimbote. The red box highlights the church in both drawings. Original drawings by the TPA. Courtesy of the Frances Loeb Library, Harvard GSD.

In Lima (1947–1948) (Table 1), since it was a pilot plan for an existing city, there is no church design for the more consolidated areas of the city. However, there are some preliminary designs for growth areas such as San Cosme, where, despite the more urban than architectural scale, the same scheme as in Chimbote is evident. In this case, the bell tower is not separate, but is connected to the church building through a sort of colonnade, similar to the design in *Cidade dos Motores*.

In Tumaco, Colombia (1948–1949) (Table 1), the only church is the one in the civic center, but it was developed only as a basic project, including a model. In an initial version, the undulating walls of the central nave in Chimbote are removed, and the roof is simplified to perpendicular vaults. Only the chancel, which is in the shape of a cylinder open to the town, and the baptistery, which is also cylindrical but located outside the nave, have walls that obstruct the view. The entrance is defined by the horizontal plane of the choir's floor slab, functioning as a portico. Even the bell tower loses its materiality and is reduced to a triangular plan metal bar tower. However, this exception is brief, and the undulating walls are soon reinstated. In this same period, coinciding with a time when Sert acknowledged that he followed the work of Félix Candela[1] closely, there is an experimentation with a more expressive roof, enlarging the curvature of the first and last vaults and extending them to the ground, at least through ribs at their ends (in the central section, they remain high enough to allow for passage underneath). The bell tower returns to the T-shaped monolith form, for which there are some iconographic sketches thanks to the plans and the model (Figure 7).

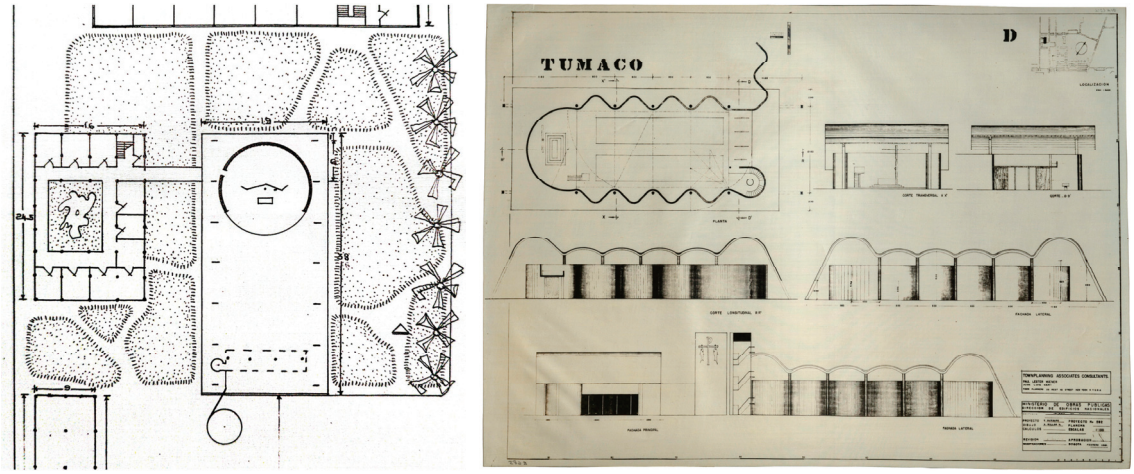


Figure 7. Tumaco: first version (**left**) and final version (**right**). Original drawings from the TPA. Courtesy of the Frances Loeb Library, Harvard GSD.

The next project is the pilot plan for Medellín (1948–1950) (Table 1). As in the Lima plan, no new churches are proposed for the city center, since there are existing ones (including the cathedral). However, churches are proposed for the new residential units. Although the drawings do not exceed the urban scale, it is possible to see how there is uncertainty between the bell tower in the form of a monolith (as in the final version of Tumaco or in Chimbote) or a more tower-like structure (as in San Cosme, Lima). Regarding the roof, one of the versions appears to move the columns outside, and, according to more detailed drawings, it seems that contiguous vaults perpendicular to the nave were considered similar to the first version of Tumaco. Due to the scale of the pilot plan, there are no references to the interior distribution (Figure 8).

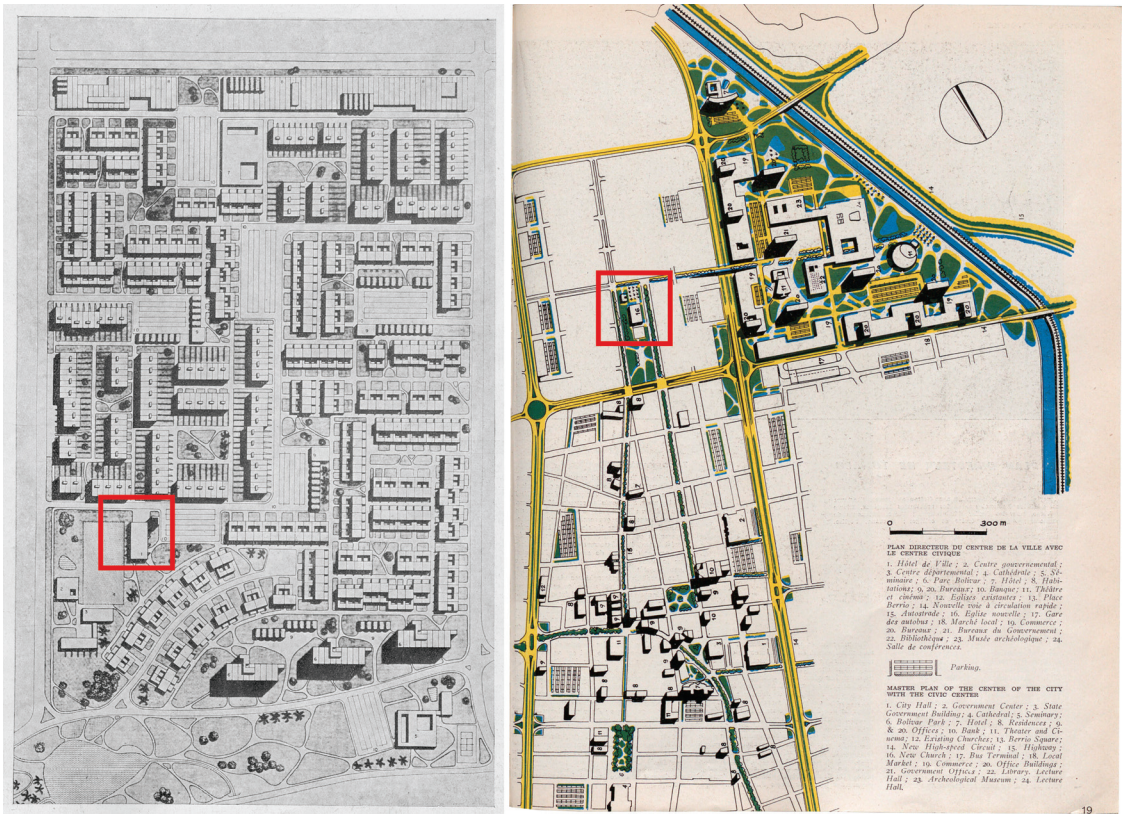


Figure 8. Plans for the housing unit (**left**) and city center of Medellín (**right**) in 1950–1951, *Architecture d'Ajourd'houi*, nº 33. The red boxes highlight the churches.

The third Colombian project was in Bogotá (1949–1952) (Table 1). In the pilot plan, in collaboration with Le Corbusier, no new churches were designed (as in other pilot plans for existing cities, the existing churches in the city were considered), but again, in the residential units, the TPA team developed some models. The church design itself does not appear very developed, but in the schools, an archetype was introduced that would be worked on in later projects. Specifically, in the plan for Quiroga, a basic project design was developed for an educational facility around a rectangular courtyard, within which a circular-shaped chapel was placed, attached to one of the courtyard's boundaries (Figure 9). In front of the chapel and connected to it, but already within the courtyard's limits, there is an elevated roof supported by four columns consisting of parallel vaults joined together and to the columns by horizontal beams crossing perpendicularly. Under this roof, a multipurpose space is generated, which, according to the project, could serve various functions: meetings, cinema, gymnasium, cafeteria,. . . and church. In the latter case, the chapel, with a central plan and altar in the middle, would function as the presbytery, and the adjoining multipurpose space would serve as the nave. In an earlier and less architecturally developed version, the elevated roof extended beyond the perimeter wall by one module. This type of roof, which would become prevalent in later church designs in Latin America, had already been considered for public buildings in the Chimbote project.

The last Colombian project is for Cali (1949–1950) (Table 1). Once again, we find a pilot plan that does not define the church building at an architectural scale. It is worth noting that in the development of the civic center model, a main church or cathedral was planned where a square-shaped area is attached to a rectangular space, with the shorter side of the rectangle matching the dimensions of the square. It is understood that the first volume, the central plan one, would serve as the presbytery, and the rest would function as the nave.

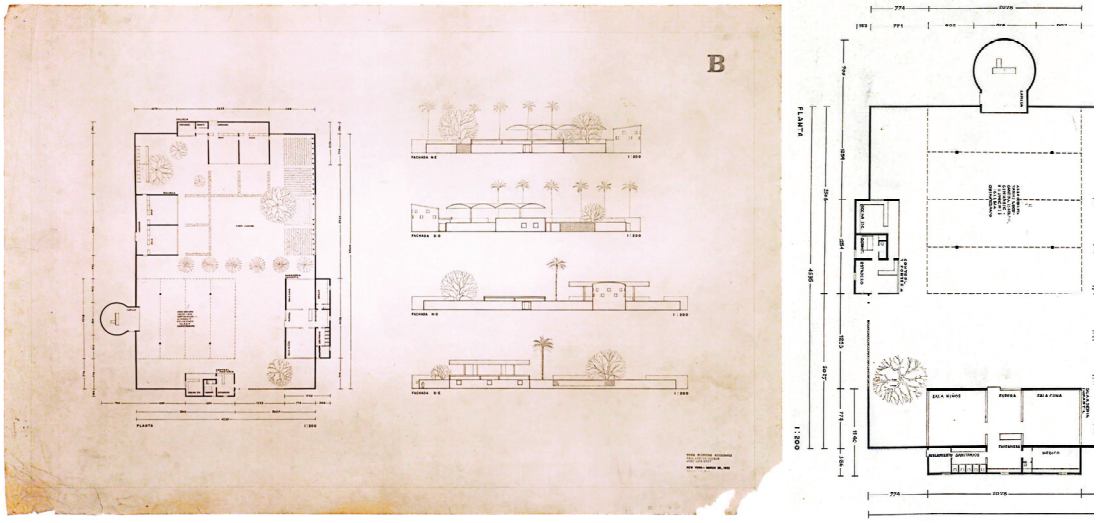


Figure 9. Left: Plan and elevations of the school in Bogotá. **Right**: Detail of the plan of the school showing the church. Original drawings from the TPA. Courtesy of the Frances Loeb Library, Harvard GSD.

The next country where the TPA worked was Venezuela, for the Orinoco Mining Company (OMC), which commissioned them to assist in designing two towns: Ciudad Piar and Puerto Ordaz (1951) (Table 1). One was intended to house workers from an iron mine, and the other was to serve as a port city for shipping the mineral. Both towns included plans for a church with a courtyard, similar to the school with a chapel developed for the residential units in the Bogotá Plan (such as Quiroga). This prototype would become the most developed by the TPA for Latin America, as they were also commissioned for architectural consultancy on the civic center project in Puerto Ordaz, particularly for the church planned within it. This is the most detailed sacred architecture project Sert had completed up to that point, and it is also the most widely published in magazines.

The basic geometry of the church in the Puerto Ordaz project is a square, which houses the main nave of the church. This is expanded by an L-shaped courtyard, extending the original square according to the proportions of the Modulor. The presbytery, described by Sert as "*ultracircular*" (with a larger arch than a semicircle), would be open towards the nave at its upper end, resembling an apse. Both the nave and the presbytery are protected by a roof of vaulted ceilings on pillars, elevated above the limits of the walls to allow for light and ventilation. This type of roof, as mentioned earlier, had been envisioned as early as the Chimbote project for covering public buildings (Figure 10).

In the case of the Pomona neighborhood project in Venezuela, there are no precise data on sacred architecture typologies. However, in the Quinta Palatino project in Cuba (1954) (Table 1), the same typology developed for Ciudad Piar and Puerto Ordaz can be seen, although it is only presented at the urban scale.

2.2. Churches Designed by Sert, Jackson, and Associates

The next sacred architecture project Sert would take on, after his Latin American experience and once settled in Cambridge, was the Chapel of Saint Bernard at the Maeght Foundation (1958–1964) (Table 1). This project, the first in this theme to be built, was still before the Second Vatican Council.

Once again, the starting point is a square plan, which in this case houses both the presbytery and the single pew in the nave. The roof of this square consists of two quarter-circle skylights facing away from each other: one above the altar, oriented south, and the other above the pew, oriented north (Figure 11). The square is extended by a contiguous

entry module, maintaining the original footprint of the Romanesque hermitage, which serves as the foundation for the new chapel (Maeght 2014, pp. 181–87).

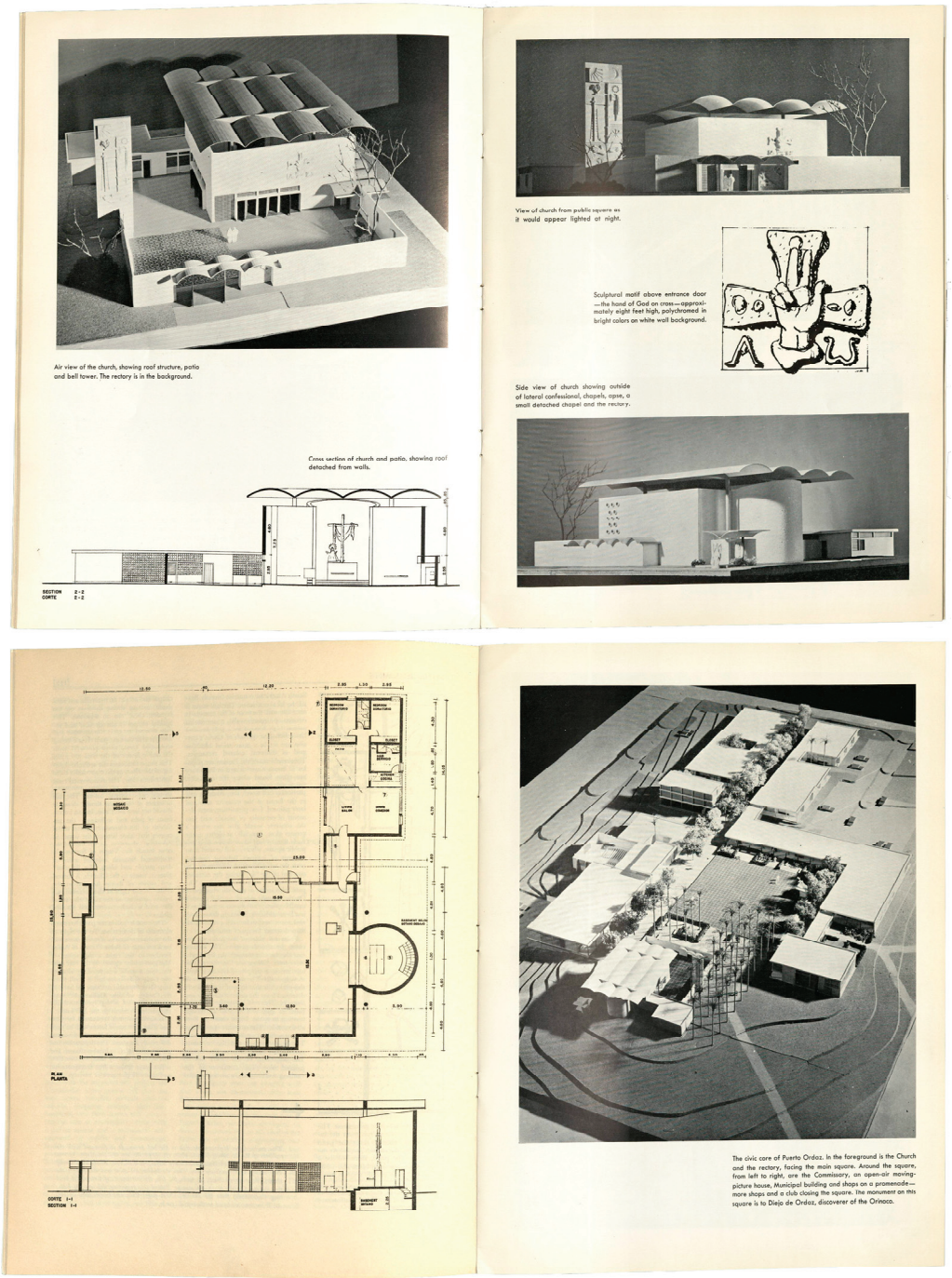


Figure 10. Plans and photos of the proposal for Puerto Ordaz and Ciudad Piar in (August 1953) *Liturgical Arts*.

The stone altar is supported by two concrete arms perpendicular to the wall to which they are firmly anchored. Above the altar, a Romanesque crucifix donated by Balenciaga serves as the altarpiece. Above this, in the skylight, a stained-glass window featuring a bird design by Braque.[2] Below the altar, the step of the presbytery is made from the same stone.

The next church commissioned to Sert's studio was for the Government Center in Boston (1963–1968), which was under development during those years. This commission was developed in parallel with the Second Vatican Council.

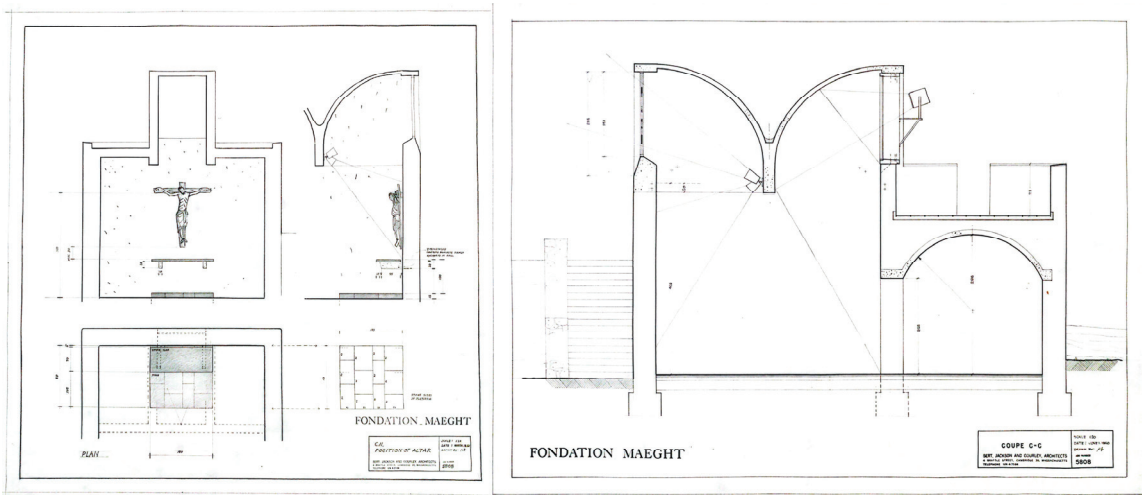


Figure 11. Sert, Josep Lluis, 1961, '*Original Plans of the Chapel of the Foundation Maeght*'. Courtesy of the Frances Loeb Library, Harvard GSD.

The starting point for the design is the central square plan. In the early versions, two squares rotated 45 degrees around their centers overlap, creating an octagon at their intersection (Figure 12). Ultimately, the design settles on a square rotated so that its diagonal forms the main axis of the church. At one end of the axis, a smaller square is rotated 45 degrees to form the entrance (in earlier versions, this also included the baptistery). At the other end of the axis, another square houses the presbytery (intersecting with the nave) and the Blessed Sacrament Chapel.

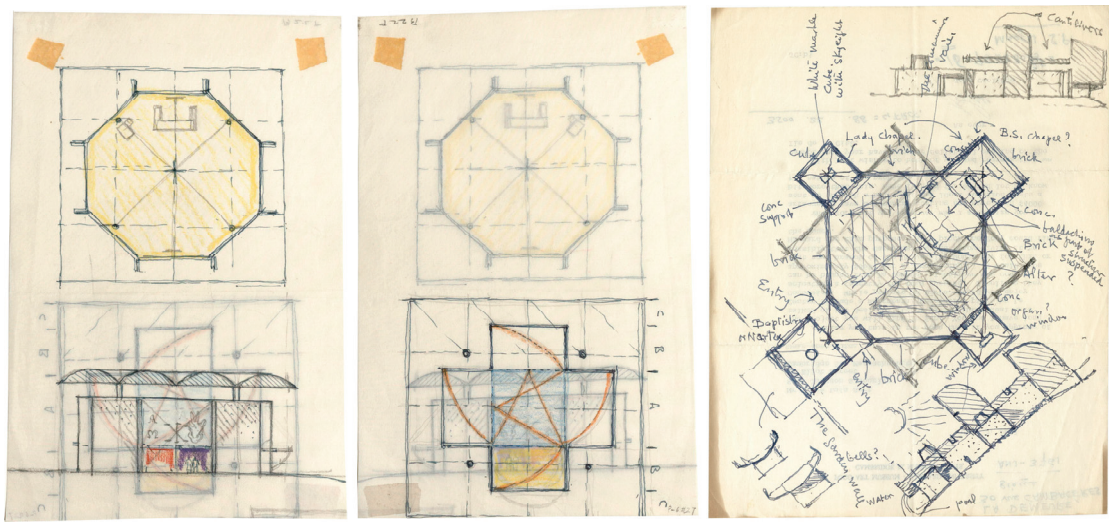


Figure 12. Geometric shapes of central plan for churches: on the left and center, two faces of a tracing paper that can be folded, from the Puerto Ordaz project; on the right, two squares in plan rotated 45 degrees, delimiting an octagon, from the San Botolph project. Courtesy of the Frances Loeb Library, Harvard GSD.

From the beginning, the light is planned to be from above. The first versions start with a semicircular skylight like the one at the Maeght Foundation, later moving to square-sectioned parallelepipeds cut diagonally (in some versions, a skylight of this type covered almost the entire roof, and in other versions, several skylights of this type were distributed across its surface). Finally, the skylights are placed at the vertices of the rotated square floor plan. The rest of the perimeter lighting comes from a subtle elevation of the roof above the church's perimeter walls (Figure 13).

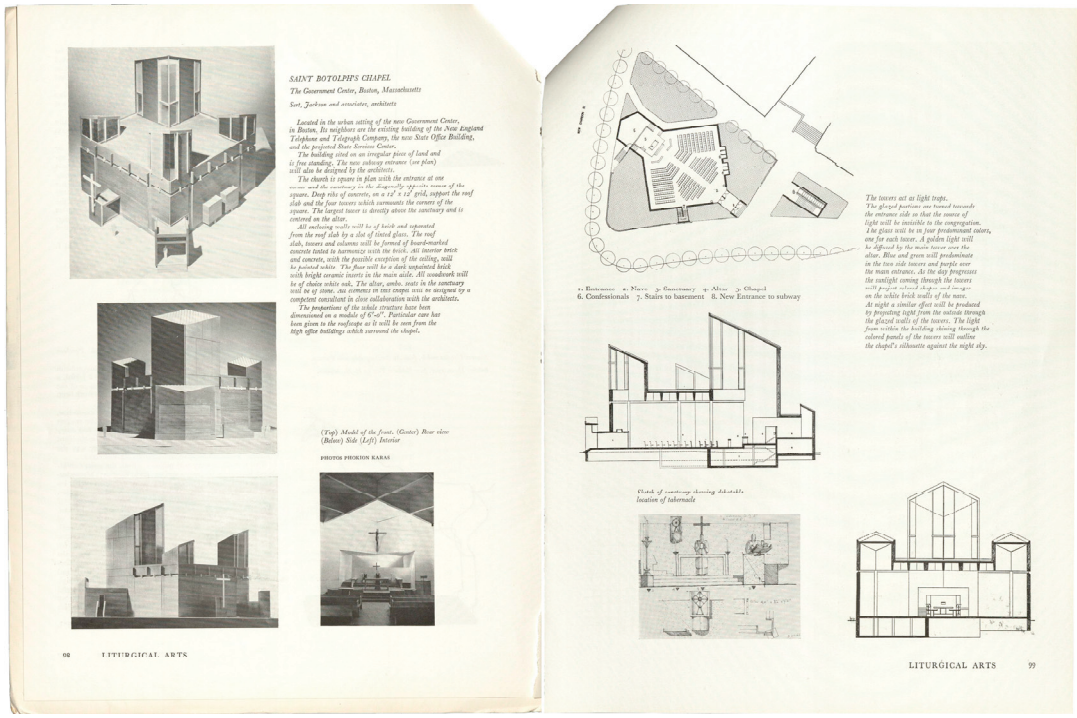


Figure 13. St. Botholp's, plans and photographs of the model in February 1967 *Liturgical Arts*, vol. 35 nº 2.

The interior of the church is planned to be flat, with both the brick perimeter walls and the concrete structure, while the notes of color come from the skylights: warm colors for the main axis (reddish tones in the entrance skylight and golden tones in the presbytery skylight) and cooler colors in the other two (greens and blues).

The composition of the presbytery is based on placing the altar in the center, allowing for celebrations on both sides of it. The wall that divides the presbytery from the Blessed Sacrament chapel does not reach the ceiling. It houses the embedded tabernacle and serves to bridge the level difference between the two spaces. The only figurative element is the cross, as seen in the model and some sketches of the presbytery, both in elevation and section.

After the Boston project, which, despite being developed down to the last detail, was never executed, the final sacred architecture project arrived at Sert's office. It was the largest in scale and would ultimately be built. This project is a convent for Carmelites in Mazille (1967–1972), and we will focus on the chapel, given the subject of this work.

The first sketch suggests a convent around a cloister, like the nearby La Tourette, where the church occupies one side of the cloister. In this sketch, the architect's intention to place the altar in an intermediate position between the church or nave for the congregation and the choir for the nuns is already clearly evident. Adjacent to the altar would be the sacristy (Figure 14).

As soon as the program for the Carmelite community was received, the project was developed based on pavilions for the cells, connected by walls that enclose the convent space (Birksted 2013, p. 10). At the highest point of the site, the entry point, is the largest pavilion containing the common areas, including the chapel. The first version of the chapel maintains a rectangular floor plan with a large skylight over the last module (of a length equal to the width of the rectangle, i.e., square in shape) which would house the presbytery and the choir (Figure 15). This module would soon be redesigned to have an octagonal plan inscribed within the width of the rectangular nave (that is, the octagon resulting from the

intersection of the square presbytery module and its 45 degree rotation, a design approach already explored in the Latin American projects and for the church of San Botolph).

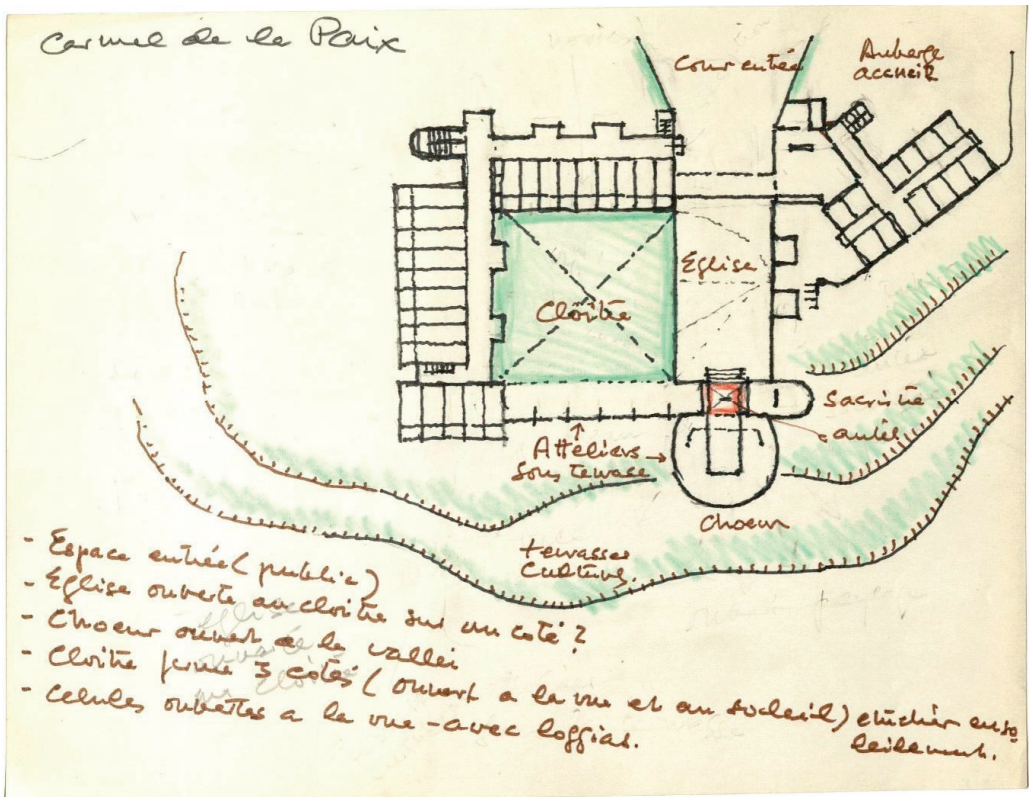


Figure 14. First proposal for the Carmel. Original drawing by Josep Lluís Sert. Courtesy of the Frances Loeb Library, Harvard GSD.

Figure 15. Photograph of the model of the first version of the Carmel with pavilions. Courtesy of the Frances Loeb Library, Harvard GSD.

This module, now with an octagonal floor plan, is studied in different ways to bring in natural light from above (Figure 16), generally through various skylight proposals: the initial one, narrow and triangular in section; a version of the same skylight with a cruciform plan; a skylight in the shape of a cube, making the presbytery module pyramid-shaped to transition from an octagonal base to the square plan of the skylight; a lantern skylight with four sloping sides; and finally, the definitive skylight, semicircular, similar to the one in the chapel of the Maeght Foundation, but obviously larger in size.

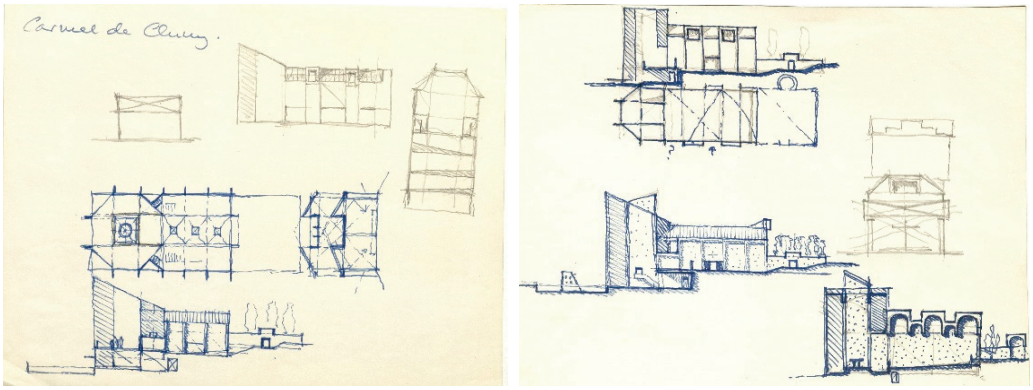


Figure 16. Drawings by Sert for the Carmel chapel. Courtesy of the Frances Loeb Library, Harvard GSD.

Parallel to the development of the presbytery module along with the choir, the '*église*' or nave for the congregation will also evolve. Sert first experimented with adding lateral skylights in various versions, and later reduced the nave by expanding the initial courtyard to function as a narthex, fitting the entire chapel into the now octagonal module of the presbytery and choir (Figure 16). Finally, he slightly reduced the courtyard to create, between the triangles of the Blessed Sacrament chapel, the entrance, and the sacristy, a kind of choir—not for the religious community, but to expand the capacity for external attendees. This element allows for communication with the sacristy and the Notre-Dame de la Paix chapel, also solving the height differences (Figure 17).

By housing both the altar, the religious community, and the rest of the faithful in the same space (with an octagonal floor plan), no further elevation differences (such as steps or similar) will be made: under the altar, simply a rug. The position of the altar will tend to be at the center of the floor plan in Sert's different arrangements, especially when the final placement of the sacristy next to the entrance allows for part of the sisters to surround the altar from behind (only they will enter the chapel from that side) and from the south side, from where they also ascend from the garden and the other pavilions. The congregation, situated around the entrance, will end up surrounding the altar from the north and west. However, since both the benches and the altar are made of wood and thus movable, as well as the pulpit and the cross (the only figurative element of the chapel, aside from the icon located in the sanctuary), they would eventually be rearranged as seen today and in the photos from the inauguration, with the altar placed against the east wall and all the seats facing east, both for the nuns (in the foreground) and the congregation (in the background).

The light will enter primarily through the skylight, adding color accents to the white interior space, supported by stained-glass windows designed by Isabelle Rouault (Birksted 2013, pp. 101–4). Two glass panels in the south and west facades are oriented towards their respective courtyards, but more to give the space a sense of openness than for the need for views, as curtains are planned to block them. They do, however, contribute to lighting, although not colored.

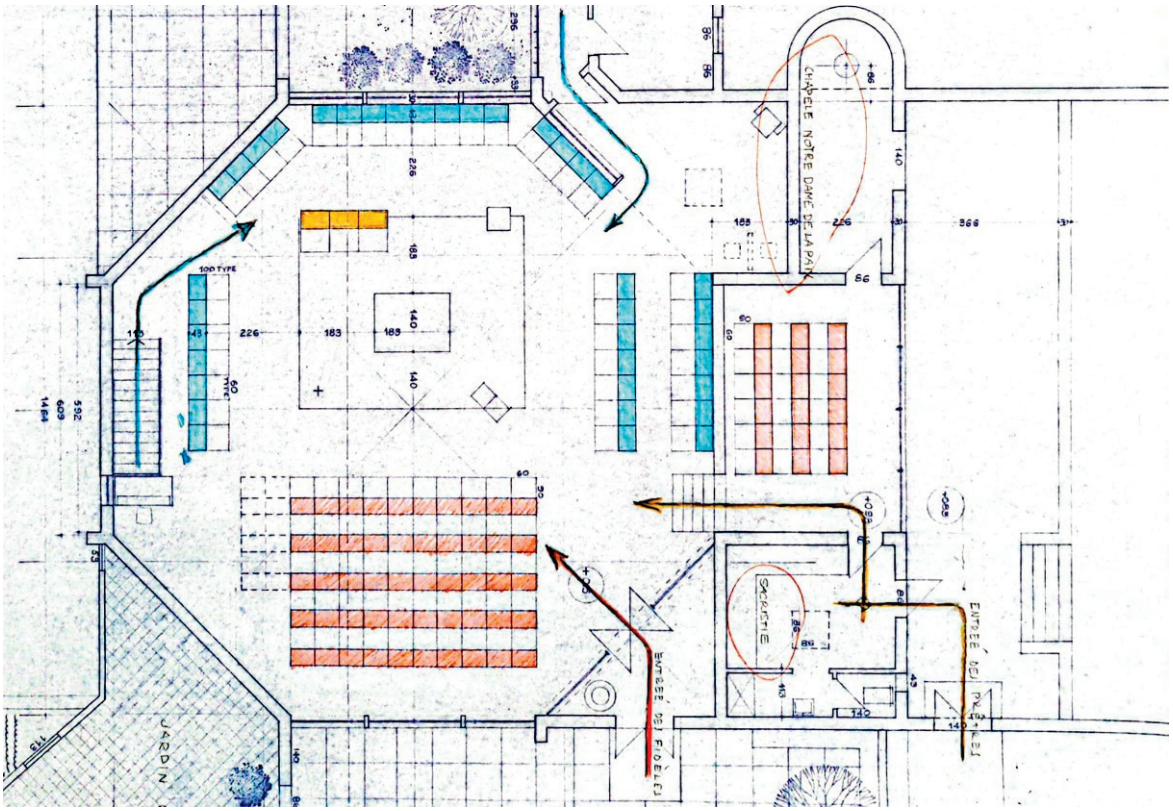


Figure 17. Final configuration of the Carmel chapel space. The arrangement of the furniture, including the altar and the cross, being non-fixed, may vary. Courtesy of the Frances Loeb Library, Harvard GSD.

2.3. Table Summary

Table 1. Summary of the information described about the different churches and chapels designed by Josep Lluís Sert.

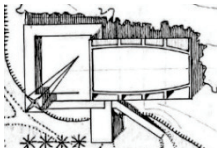
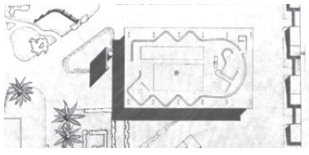
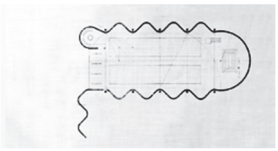
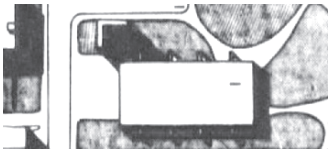
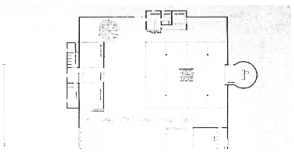
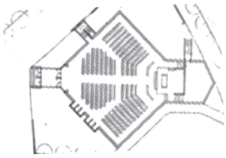
Project	Definition Scale	Model	Built	Chancel Shape	Shape of the Nave	Main Ingress of Light	Altar Position	Plan
Cidade dos Motores (1944–1946)	Urban scale	No	No	No data available	Rectangular	Between main and lateral nave	No data available	
Chimbote (1946–1950)	Preliminary Project	Yes	No	Semicircular	Rectangular	Lattices in the roof	Centered	
Lima (1947–1948)	Urban scale	No	No	No data available	Rectangular	No data available	No data available	

Table 1. *Cont.*

Project	Definition Scale	Model	Built	Chancel Shape	Shape of the Nave	Main Ingress of Light	Altar Position	Plan
Tumaco (1948–1949)	Preliminary Project	Yes	No	Semicircular	Rectangular	Between roof and walls	Centered	
Medellín (1948–1950)	Urban scale	No	No	No data available	Rectangular	Between roof and walls	No data available	
Bogotá (1949–1952)	Preliminary Project	No	No	Ultra-circular	Square	Between roof and walls	Centered	
Cali (1949–1950)	Urban scale	No	No	Square	Rectangular	No data available	No data available	
Ciudad Piar, Puerto Ordaz (1951)	Preliminary Project	Yes	No	Ultra-circular	Square	Between roof and walls	Centered	
Quinta Palatino (1954)	Urban scale	No	No	No data available	Square	Between roof and walls	No data available	
Fundación Maeght (1958–1964)	Detailed Project	Yes	Yes	Square	Square	Two opposed skylights	On one side	
San Botolph (1963–1968)	Detailed Project	Yes	No	Square	Square	Four skylights in the corners	Centered	
Carmel de la Paix (1967–1972)	Detailed Project	Yes	Yes	Octagonal	Octagonal	Centered skylight	Centered	

3. Discussion

The churches and chapels designed by Sert are always part of a larger urban composition. As he himself mentioned in several of his writings, these types of buildings are one of the possible facilities within neighborhood units. In fact, larger churches can be included within higher-ranking entities than the neighborhood unit itself.

The church is a public facility and an identity-defining element of the community, and, therefore, it should be part of the heart of the city or urban core (Sert and Mumford 2015, p. 19). It is important for the church to have an element (usually a bell tower, as in Sert's churches for Latin America) that serves as a landmark, just as bell towers have historically served in architecture, standing apart from each other (Sert and Mumford 2015, p. 106), unlike the concentration of high-rise buildings in the financial centers of some contemporary cities (Sert and Mumford 2015, p. 120).

From the example of these buildings of the past, Sert finds a way to approach the necessary monumentality in modern design as well (Sert et al. 1943). In the absence of a bell tower, an element that protrudes above the building can fulfill this function, such as the skylights of the Chapel of San Botolph, or the entire volume of the chapel, as in the case of the Convent of La Paix, like the library of the Miró Foundation.

In the monument in particular and in his entire religious work in general, Sert finds the opportunity for his longed-for relationship between "Architecture and the Visual Arts" (Sert and Mumford 2015, pp. 41–46), as he explained in 1954, or, in other words, "The relationship between painting and sculpture with architecture" (1951), "The integration of the visual arts" (1955) (Sert and Juncosa 2011, pp. 33–48). Sacred architecture and its implementation in the city can serve as "Places of encounter for the arts" (1975) (Sert and Juncosa 2011, pp. 57–68).

A recognized example of this aspect is the collaboration with Hans Hofmann for the Chimbote Project. Mumford's thesis is that the lack of understanding may have been because, for the architects, the monument had to be part of the overall architectural composition, while for the painter, it had to be able to have autonomous identity (Costa 2004, p. 65).

For Sert, the artwork in sacred architecture must be integrated into the project, its composition, and its intentions. This is how the churches of Ciudad Piar and Puerto Ordaz were designed: the bell tower with symbols of the Passion, popular in Latin America; the ceramic of Saint Francis next to the entrance gate; the monogram of the Virgin on the far right of the main wall; the relief of the cross with the hand of God at the top of the main facade of the building; and the chapel of Our Lady of Fatima on the rear facade of the building (Sert 1953).

Similarly, in the chapel of the Maeght Foundation, the stained glass window depicting the Paschal Announcement through the White and Purple Bird, by Braque (1962); the stained glass of the Cross and the Rosary, by Raoul Ubac (1963); the Stations of the Cross in carved slate, also by Raoul Ubac (1961–1963); and, outside, the granite sculpture of Saint Bernard by Eugène Dodeigne (1968). These original pieces, commissioned for the chapel, are combined with the Romanesque crucifix donated by Balenciaga as a retable, and the remains of a Romanesque bas-relief at the chapel entrance.

In the church of San Botolph, the figurative elements were never fully defined, aside from a few specific sketches hand-drawn by Sert himself. As indicated in the article from *Liturgical Arts*, a consultancy was involved in working in collaboration with the architects (Sert, Jackson, and Associates 1967). The most defined element would possibly be the tabernacle with an ostensorium, embedded in the wall that separates the presbytery from the chapel of the Blessed Sacrament, for which Sert used the tabernacle of San Clemente as a reference, according to a handwritten note by Sert.

In the case of the Carmel of La Paix chapel, the initiative for collaboration did not come from the architect, but from the painter Isabelle Rouault (Birksted 2013, p. 101). Sert accepted the offer after researching and studying it, and he arranged the stained-glass windows on the west-facing façades and in the southern skylight, without figurative composition (the concrete cross of the skylight was designed by the architects, while the stained glass filled the empty spaces). The function of the stained glass was to bring color to the white walls of the interior.

Regarding the position of the altar, as noted, it occupies a central place within the presbytery, even in churches designed for projects in Latin America prior to the Second Vatican Council. However, these are not altars designed for celebrating "coram populo", as seen in the section of Figure 10. Only in the Chapel of Saint Bernard for the Maeght Foundation is the altar placed against the wall.

For the San Botolph project, developed concurrently with the Council, we find a handwritten note by Sert himself asking, "Altar to be accessible for all sides?", and in the same note another statement, "Frontal altar: NO".

In any case, we have not found evidence of whether he closely followed the liturgical debates during the Council or what his references were in this regard. We can only infer from the projects themselves. Furthermore, as López-Arias points out, strictly speaking, the sacred space was not extensively addressed during the Council; rather, it has been in the subsequent literature that this topic has been, and continues to be, developed (López Arias 2021).

As for the theological references, we know that the greatest influence on Sert was the French Jesuit Teilhard de Chardin, of whom he had all his works, particularly his text *Building The Earth* (Arnús 2019, p. 209). In this work (Teilhard de Chardin and Lindsay 1959), it is stated:

> "*Between Man and Woman, a specific and reciprocal power of sensitization and spiritual fertilization seems in truth to be slumbering still, and calling to be released in an irresistible upsurge towards everything which is truth and beauty.*"

This search for truth and beauty will be present throughout Sert's work, particularly in his sacred architecture.

On the other hand, Teilhard's work does not extensively address liturgical aspects. Additionally, as Cuénot mentions, he was scarcely influenced by other thinkers, except as catalysts (Cuénod 1966, p. 132). In his *Hymn of the Universe* (Teilhard de Chardin 2004), the first chapter, "The Mass on the World," is more of a "Christic humanism", as Alfredo Fierro defines it in the prolog of the Spanish edition we cite, or a work of a mystical nature, rather than an attempt at a liturgical text.

One characteristic of Teilhard's theology is its Christocentrism, as described by Father Colomer (Colomer i Pous 1963), an idea that would also be shared by Agustín Udías (Udías Vallina 2007). Federico Ruíz, after commenting on Mooney's text about the Mystery of Christ in the work of the French theologian (Mooney 1967), states that "as is well known, Christology in Teilhard's work is everything" (Ruiz Salvador 1969, p. 210).

It will come as no surprise, therefore, that the sacred space in Sert's architecture tends to be centrally planned, with the altar (the place of consecration) at the center and, next to it, the crucifix. Christ, truly present in the Eucharist, and Christ represented in the throne of the Cross—a cross that Sert describes in the following terms:

> "*The monumental cross of the altar is of coarse driftwood, sported with bright colors. The cut branches of the wood should show. It should not be a soft Cross, but an instrument of pain and suffering -the antithesis of the chromium plated metal crosses that have become the vogue in "modern" churches.*" (Sert 1953, p. 113)

This exaltation of matter, which we read in the description of the cross, is transferred to the other construction elements of the temple: concrete with its texture, through specially selected formwork, alternated, for example, with brick, as in the Chapel of San Botolph; or stone on the exterior and plaster on the interior of the Chapel of San Bernardo. This respect for the texture and properties of the material is a general characteristic of Sert's work, which, in the context of his sacred architecture, harmonizes perfectly with Teilhard's theology. Leandro Sequeiros, in his article on the early works of the French Jesuit, specifically referencing one of the chapters of *Hymn of the Universe*, states: "In the background of Christ in Matter lies an intimate reflection on the presence of Christ in the material reality" (Sequeiros 2016, p. 457).

Towards that altar where the bread and wine are consecrated, accompanied by the cross, all gazes converge. There will be no other elements to distract attention or any other focal points. The sunlight, which is not only necessary for visibility but also serves as proof of the participation of the stars in the liturgy and, with its movement, in the words of Alberto Campo, *constructs time* in architecture (Campo 2009, p. 48), will enter primarily from above, in a way that does not distract attention, which must remain focused on the presbytery. Any other openings at the height of the occupants will serve to provide additional light or potentially expand the space, but will always be positioned behind. This sunlight, as experienced through the stained-glass windows in the Chapel of the Maeght Foundation, will be responsible for adding color to the interior, which, otherwise, will always be painted white—the color of the poor, in Sert's own words (Birksted 2013, p. 53).

The other theologian with whom we know Sert had a relationship, Raimon Panikkar (Arnús 2019, p. 209; Bohigas 2014, p. 529), although not strictly a liturgist, did write about the subject, particularly focusing on the importance of ritual in his anthropological and theological thought. For Panikkar, the temple would be more like a creature, in which divinity dwells, and the world as a place of relationship between the two.

In *Culto y secularización* (Panikkar 1979), which gathers ideas from *Secularization and Worship* (Panikkar 1970) and *Man as a Ritual Being* (Panikkar 1977), the ritual is described as something without which humans cannot live, referring to it as a "cosmic liturgy." These rituals do not have to be detrimental to secularity; rather, they should be close to human life.

Although Panikkar does not specifically reference this, the fact that the buildings of the churches and chapels designed by Sert follow formal archetypes that can be used in buildings with various purposes aligns with this universality. However, the realization of the archetype will not only be for its function (in this case, liturgical), but also for its geographical, cultural, and identity characteristics, etc., because the sacred space must reflect the spirit of its time and culture.

In this way, the roof of parallel vaults joined by two beams supported by four pillars, which in Peru served as a market (Figure 18), in Colombia can serve as a school, and in Venezuela for a church, but adapting in the configuration of the entire building (openings, ventilation, materials, and construction techniques, and, above all, ornamental and figurative elements) to the characteristics and customs of each use and place (Sert 1953, p. 113). Similarly, a semicircular skylight can serve for a painter's house in the Mediterranean, an art center in Barcelona, a library in Boston, or a chapel in eastern France, or an octagonal tower can serve both for the Miró Foundation library and for the Carmel de La Paix church.

This dimension of the sacralization of secular realities is shared by Teilhard, according to Andreas Gonçalves Lind (Lind 2023), who, after noticing the influence of Teilhard in a text from *The Spirit of the Liturgy* (Ratzinger 2001), adds the following quote from the same author:

> "*The function of priesthood is to consecrate the world so that it becomes a living Host, so that the world itself becomes liturgy: that liturgy should not be something parallel to the*

reality of the world, but that the world itself should be transformed into a living Host, that it should become liturgy." (Benedicto XVI 2009)

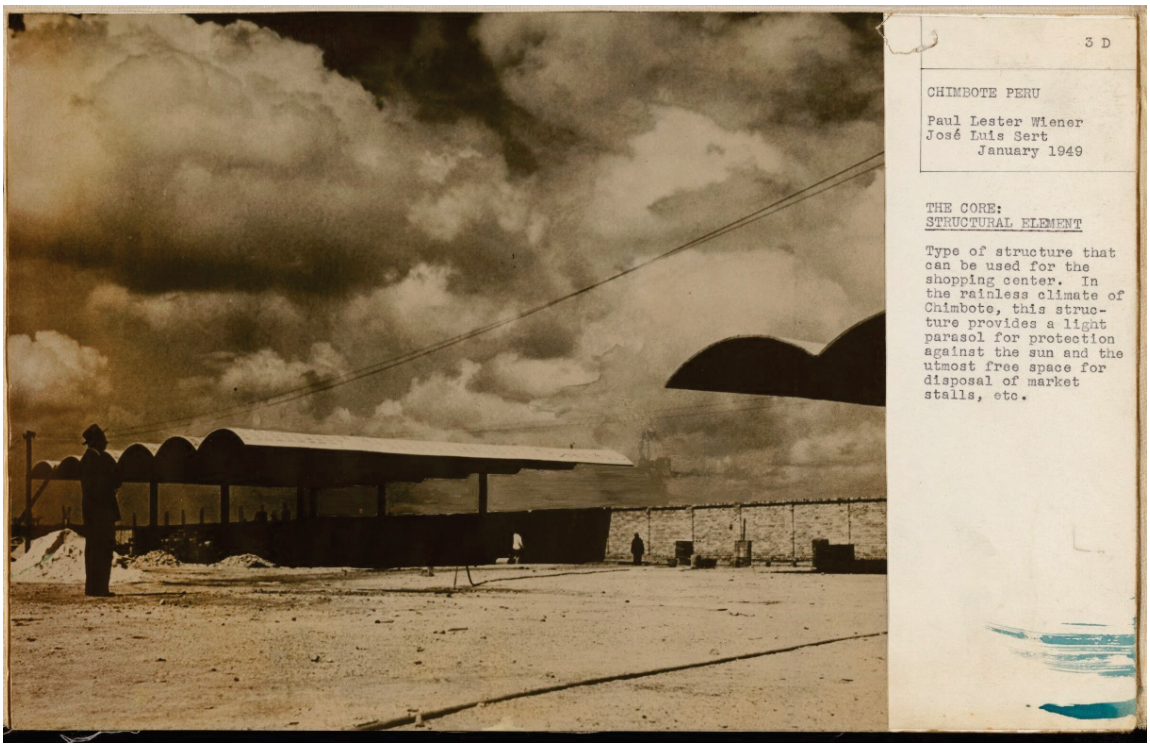


Figure 18. Photograph of a roof included by Sert in his exhibition on the Chimbote project for CIAM VII. Courtesy of the Frances Loeb Library, Harvard GSD.

Finally, the only point where Sert did not manage to carry out his architectural ideas and ultimately gave in to the client's request is in the interior of the Carmel of La Paix chapel. This was not only because the altar, being designed as mobile, ended up being placed against the wall opposite the visitors' entrance, allowing only the celebrant to pass through (this position was never adopted in the various versions drawn by Sert)—but also for something more permanent: the architect's intention to emphasize the materiality of the exposed concrete through low-angle lighting on the walls. The Carmelite community not only rejected this idea (the lights were placed in the area of the skylight), but they even covered the exposed concrete with a finishing material (Birksted 2013, pp. 105–7). In the letters between Sert and the prioress from 29 November and 2 December 1970, one can see not only an esthetic disagreement, which was absent in other parts of the convent where there was total agreement (even for the exposed concrete as an interior finish), but rather a difference in spiritualities. Perhaps the little interest Teilhard de Chardin showed in the works of the Carmelite Saint John of the Cross, despite being recommended by close friends (Gregorio de Jesús Crucificado 1967, p. 362), is similar to the lack of enthusiasm that Mother Marie-Thérèse had for raw concrete in the interior of her convent chapel, despite the strong harmony she shared with the architect in other parts of the convent (Figure 19).

Figure 19. Interior view of the chapel at Carmel de la Paix, where the white-clad walls, rather than exposed concrete, can be observed. The wooden crucifix, the Blessed Sacrament chapel, one of the stained-glass windows, and the choir area with the garden in the background are also visible. Courtesy of Eloi Aran Sala.

4. Conclusions

As a summary, we can conclude that the sacred space in Sert's work is centrally planned, with the altar at the center. This space is expandable according to the needs of the congregation, either through a nave designed for that purpose (like at Chimbote, Tumaco, Bogotá, Cali, or San Botolph) or through courtyards (like at Ciudad Piar and Puerto Ordaz, Quinta Palatino, or the Carmel de la Paix).

Natural light enters primarily from above, avoiding openings at eye level that could distract attention, as can be seen in all the projects for which we have sufficient data to deduce it (10 out of the 12 projects).

The interior of the church is white, respecting and even enhancing the texture of the materials. Subtle accents of color are added in certain areas to highlight them, like at Chimbote or at Ciudad Piar and Puerto Ordaz, or else the light is directly colored through the stained-glass windows, like the chapels for the Maeght Foundation or the Carmel de la Paix.

The iconographic elements from the other visual arts reflect the culture of the faithful community and are integrated into architectural design (Sert 1953). There is no traditional altarpiece, and the iconographic reference is always the crucifix, which occupies a central position next to the altar, as can be seen in all those projects that go so far as to define this aspect: Chimbote, Tumaco, Ciudad Piar and Puerto Ordaz, San Bernardo, San Botolph, and the Carmel de la Paix.

All of Sert's church projects are part of larger urban-scale projects. Except for the Government Center in Boston, these urban-scale projects are also led by his office.

He designed an archetype that met the conditions to serve as a sacred space, but not a specific church typology. The same archetype, in different contexts and with the appropriate auxiliary elements, can serve other purposes (Figure 20).

Figure 20. Library of the Fundación Miró at Barcelona. Courtesy of F87 Arquitectura Ingeniería.

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Notes

1 In his writing "Felix Candela: Architect, Ingenious Engineer" (The Josep Lluis Sert Collection, Hollis ID: 000603276), Sert acknowledges that, from the mid-1940s, when he first heard about Félix Candela, he became increasingly interested in his work to the point of eventually becoming friends. For example, Sert commissioned Candela to design the structure of the Presidential Palace in Havana.

2 The artworks present in the chapel are described on a plaque inside. In addition to the 12th-century Christ donated by Balenciaga, there are Romanesque remains from the 12th and 13th centuries found during excavations in southeastern France. As for commissioned artworks for the chapel between 1962 and 1963, there are two stained glass windows created by Charles Marq: one above the altar, designed by Georges Braque and titled *White and Purple Bird* (1962), and the other symmetrically placed, designed by Raoul Ubac and titled *The Cross and the Rosary* (1963). The twelve stations of the via Crucis, carved in slate, are also the work of Raoul Ubac (1961–1963), and the granite sculpture of St. Bernard at the entrance to the chapel is by Eugène Dodeigne (1968).

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The Apse of the Gothic Cathedral of Tortosa versus Augustine of Hippo's Civitate Dei

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Abstract: This research delves into the influence of St. Augustine on the construction of the Gothic cathedral of Tortosa. The canonical cathedral of Tortosa underwent re-establishment in 1155, which was carried out by Bishop Godfrey who was the abbot of Saint Rufus of Avignon and was governed by *Beati Augustini* rule. The presence of St. Augustine in the Capitular archives with *De Civitate Dei* (ACTo-20) from the XII century is examined. This, coupled with a spatial analysis of the liturgical space using laser scanning (TLS), serves to validate the historiographical thesis put forth by Wilhelm Worringer, Erwin Panofsky, and Otto von Simson for understanding the construction of the apse of the Gothic cathedral (1346–1441). This methodology establishes a bijection between patristic and Neoplatonic sources and the interpretation of the liturgical space's dimensions using statistical systems. This approach addresses the construction of the apse through the incorporation of a heptagon, a geometric figure that is absent in Euclid's *Elementa* and Ptolemy's *Almagest*. In conclusion, it is determined that both the imagery and metrics employed in the design of a radial heptagonal apse, as well as its cross-section, are influenced by both St. Augustine and the metrics of the *Neoplatonics*, which remain present in the Chapter Archives.

Keywords: Augustine of Hippo; cathedrals; Neoplatonism; proportion; sacred geometry

1. Introduction and Objective

The canon of Tortosa was refounded in 1155 by Bishop Godfrey (+1165), abbot of San Rufo de Avignon, following the rule 'vivere sub regula Beati Agustini, et iuxta consuetudines Ecclesiae Sancti Ruffi' (García 1998, pp. 10–13). Regarding la regula, it originally dates back to 1039 when Benedict, Bishop of Avignon, oversaw the functions of the choir and the recitation of the Psalter (Misonne 1963, pp. 471–89). It was governed similarly to other cathedrals in the Catalan territory, such as Vic, Lleida, Girona, and Seo de Urgel (Calvo 2014, pp. 78–79), where the request for books was already ordained within the canonical schedule (Rule 37) (Orozco 1881, p. 36). From this moment on, the construction of the Romanesque cathedral began in 1158, and it was consecrated on 28 November 1178. On 20 April 1346, Bishop Arnau de Llordat (1341–1346) and the Chapter commissioned the *magister operis*, Bernat Dalguaire (+1347), a new cathedral that was to replace the *ecclesia vetulam.* (ACTo, NC 1346. 11).

Indirect measurement procedures such as close-range photogrammetry (CRP) and terrestrial laser scanning (TLS) allow for the analysis of the construction reality of the Tortosa Cathedral. This makes it possible to carry out graphic experiments on architectural objects and obtain contrasted explanations relative to the hypotheses based on the geometric and constructive research of seo dertosense[1].

The results obtained from these records can be statistically analyzed. These numerical values are subjected to explanatory treatment, attempting to determine the causes and consequences of the construction of the sacred space of the cathedral. The evolution of formal changes is considered a concrete phenomenon established by liturgical and

technical changes during the gestation and construction period of the Gothic apse (1346–1441) (Figure 1).

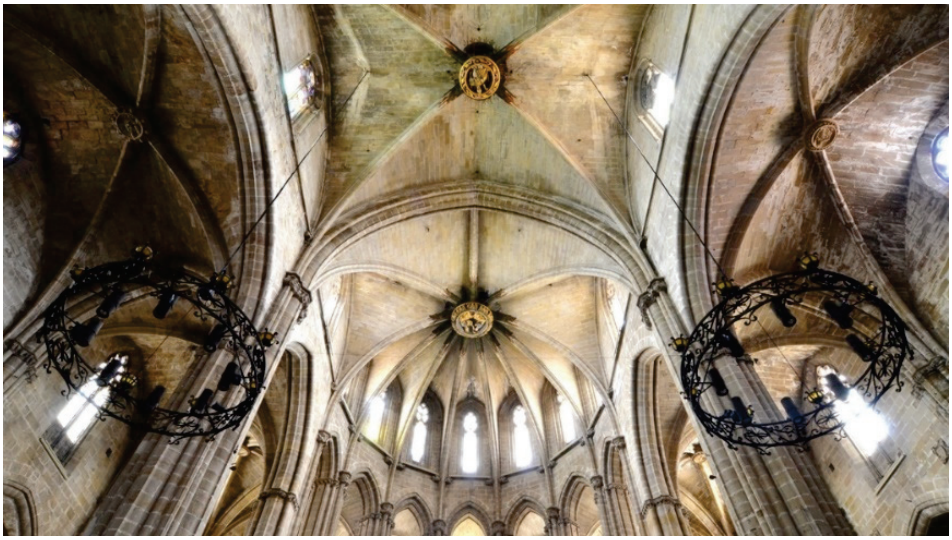


Figure 1. The apse of the Cathedral of Santa María de Tortosa (1346–1441). Presbytery keystone with the Coronation of the Virgin and Saint Augustine.

Not only the *what* but also the *why* of the causes is sought; therefore, the evolution of this liturgical space and how it has reached its current state are studied. The objective is to create an explanatory model that allows for the observation of the sequences of cause and effect among the promoters, the Chapter and bishop, and the magister operis who have worked on the Tortosa Cathedral. In this way, it is explained, from the perspective of complexity, that this sacred space has been generated by the complementation of both types of knowledge, which were defined as *scientia theoria* and *scientia practica* from the perspective of medieval philosophy. This concept spread in Gothic Europe from Domingo de Gundisalvo's *De Scientiis* (fl. 1150) and its precedent, al-Fārābī's "Catalog of the Sciences" (c. 870–950).

Al-Fārābī states that *Scientia doctrinali* includes arithmetic, geometry, optics, astronomy, mathematics, music, the science of weights, and engineering; it specifies the difference between theory and practice (González 1932, pp. 97–105). Gundisalvo uses these same terms in the *De Scientiis* (Alonso 1955, pp. 85–112), definitions disseminated to the world of European cathedrals by Vincent of Beauvais (c. 1194–1264) in the *Speculum Doctrinale* (Mâle 1910, pp. 37–40).

Classical historiography assumes in the scholastic context that the Gothic cathedral is the manifest result of the will of two parties: that of the promoter and that of the builder. The interaction between both figures was highlighted by Wilhelm Worringer (1881–1965) in the *Formprobleme der Gotik* (Worringer 1911) and by Erwin Panofsky (1892–1968) in *Gothic Architecture and Scholasticism* (Panofsky 1951). Otto von Simson (1912–1993) initially tackled the question of learned sources (Simson 1952, pp. 6–16), seeking them in Augustine of Hippo's *De Civitate Dei*, *De Ordine*, and *Musica*, and further developed them in *The Gothic Cathedral: The Origins of Gothic Architecture and the Medieval Concept of Order* (Simson 1956). Methods utilizing indirect records such as close-range photogrammetry (CRP) and terrestrial laser scanning (TLS) (Figure 2) allow for a precise analysis of the three-dimensional space, enabling the examination of points that were previously inaccessible and allowing them to be contrasted with these historiographical theses.

Saint Augustine acknowledges in the *De ordine, libri duo* (386) that the Trivium and Quadrivium programs were the basic instruments for understanding the Holy Scriptures. He proposes the formation of man in the arts (De Ord. II.16, 44)[2] as they promote the elevation of the spirit on the path toward God. He considers that moderate and rational erudition in the

liberal arts makes man more agile and steadfast in encountering the truth of his knowledge[3]. In the *Confessionum, libri tredecim* (397), geometry, music, and arithmetic are found, because the ability to understand and the acuity in discerning are gifts from God (Conf. IV, 16, 30)[4]. He reports that what unfolds reasonably in ordered forms was designated by the name rhythm, which in Latin can only be called numerus (De Ord. II, 14, 41)[5]. Thus, he sees the need for the study of numbers for the order of music, geometry, and the movement of the stars (De ord. II, 5, 14)[6]. In the *De Genesi ad Litteram libri duodecim* (401), he recalls that the number without number is that by which all things are formed. The weight without weight is that by which balance is established, reducing all things to stillness (De Gen. ad litt. IV.8)[7]. He defines geometry in the beauty of figures, in the figures and dimensions, and in the dimensions and numbers. He also inquires whether lines and spheres or any other form and figure in reality exist as they are contained in the intellect, calling geometry the science that distinguishes and orders these understandings (De Ord. II.15, 42)[8].

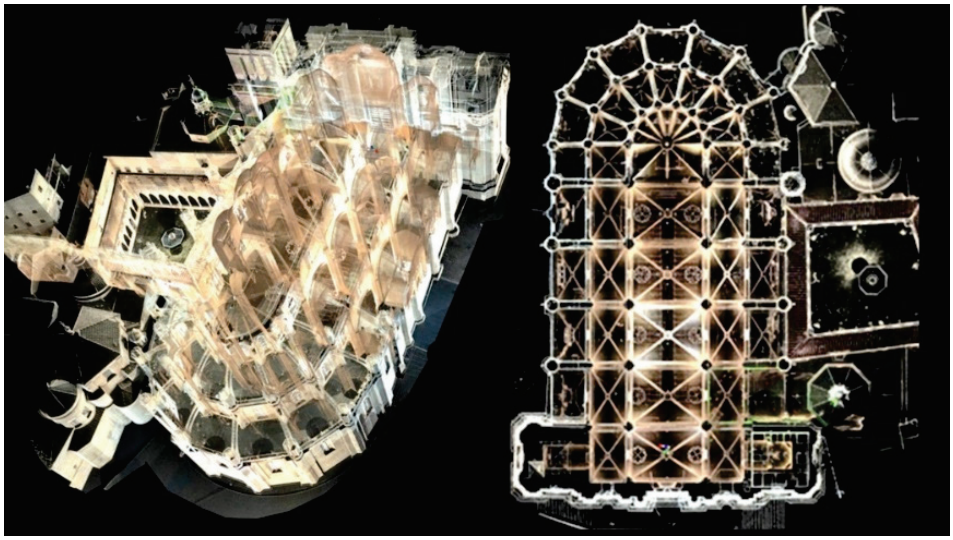


Figure 2. A terrestrial laser scan (TLS) of the Tortosa Cathedral.

With these data, the objective is to explore the influence of the thought of Augustine of Hippo (354–430) through the Augustinian Chapter on the established order in the construction of the cathedral, using as reference the codices of the Capitular Archive of Tortosa (ACTo). Saint Augustine himself states in *De libero arbitrio libri tres* (388–391) that we all desire to be happy and wise, for no one can be happy without being wise (lib. arb. II, 9, 26)[9].

The Augustinian model inherited by monks distinguishes between uti and frui[10], relating to the use of temporal realities, wisdom, and the enjoyment of the eternal. These terms also applied to the right of usufruct, which can be indirectly applied to the construction of cathedrals. At the threshold of the Renaissance, the Christianized Neoplatonic model is subtly linked to the sensible and rational dimensions of conjectural science. Thus, the canon of Noyon and mathematician, Charles Bovelles (1483–1553), completes this journey by revisiting Saint Augustine to show the Trinitarian dimension of the overcoming of practical or erudite knowledge (Trottmann 2015, pp. 805–16). In this way, the order of Gothic construction allows us to address geometric and proportional issues that stem from the knowledge concentrated in some cases in Augustinian works.

An example is how the heptagonal apse of the Tortosa Cathedral was drawn. Charles Bovelles himself acknowledged in the *Livre singulier et utile, touchant l'art praticque de geometrie* (1542) that a figure as important for Christian symbolism as the heptagon did not appear in Euclid's *Elements* (c. 325–c. 265 BC) (Bovelles 1542, 25v–28r). The French humanist had already discussed and constructed this figure in the *Geometricum Introductorium* (1503), published in Paris in 1510 (Bovelles 1510, p. 196), a work present in Tortosa (ACTo 300) (Figure 3)[11].

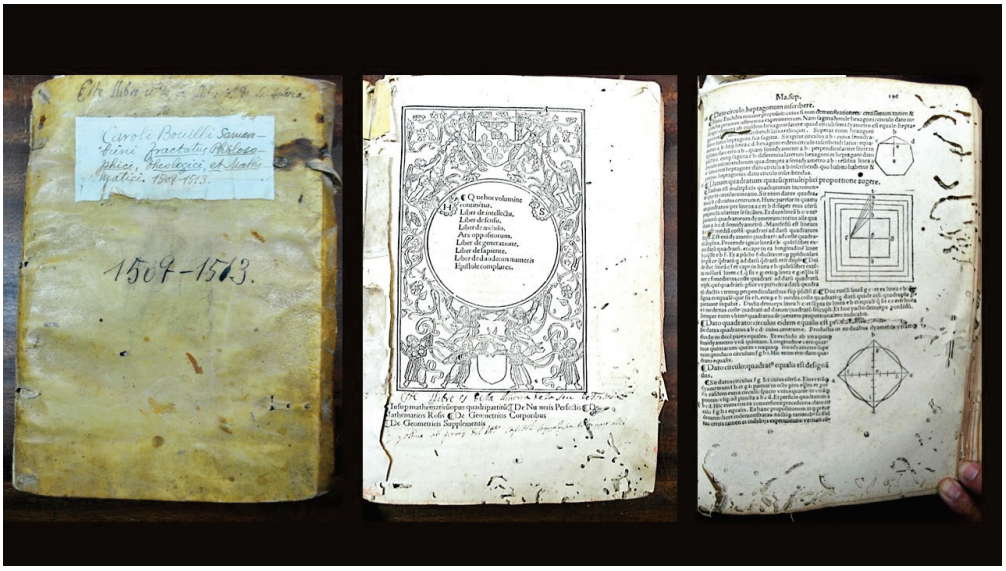


Figure 3. Charles Bovelles' *Geometricum Introductorium* (1510). ACTo 300.

2. The Works of Saint Augustine in the Tortosa Cathedral

In the Inventory of the Tortosa Cathedral of 1420, the rule of the Augustinian canon is listed as *Regia de sent Agosti* [114], *Item, Regula canonicorum* [205], *Regula beati Augustini* [213], and *Regula de sent Augusti* [215], and the works of Saint Augustine are as follows: *De civitate Dei* [5], *Supra psalterium* [6], *De penitencia* [23], *Liber vocatus* and *De penitencia* [68], *Diversa originalia beati Augustini* [98], *Liber Questionum beati Augustini* [100], and *Diversa originalia Augus* [110] (Baiges 1999, pp. 3–20). Of particular interest for our analysis are *De civitate Dei* [5] ACTo 20 from the 12th century and *Supra psalterium* [6], known as *Enarrationes in Psalmos*, for which its reference has been lost. In said inventory, *Item, un libre appellat* Macrobi [183] is preserved in the *Commentarii In Somnium Scipionis* of ACTo 236 XIII by Macrobius (fl. 400) due to the special teaching relationship between both figures.

In the cataloging by Enrique Bayerri Bertomeu (1882–1958), there is an indication of the following works: ACTo 20, *De civitate Dei*; ACTo 55, *De Trinitate* and *De Vera Religione*; ACTo 86, *Contra Plagianos*, *Liber de spiritu et littera*, *Liber super Genesi ad litteram*, *Expositio Symboli, De immortalitate animae*; ACTo 110, *Meditaciones*; ACTo 130, *De Corpore et Sanguine Christi;* ACTo 131, *De Corpore et Sanguine Christi;* ACTo 173, *De sermone domini de mundis*, *De munditia cordis;* ACTo 195, *Exortación del Apocalipsis de San Agustín*; ACTo 217, *Extractos de la Epistolas de San Jeronimo;* ACTo 222, *Epístola beati Augustini ad Virginies*; and ACTo 230, *De Confessione peccatorum*, *Admonitio*, *Ex tractatu S. Agustini in Euangelio ubi dicit helemosinas faciendas*, *De peccato disiderii, Die quidem omni et omni hora et cura omnio continua, Sermo de plasmo XLVIII, Sermi de capitulo euangelii ubi dicit, remitite et remitetur nobis, Epistula pulchra satis, De muliere curva, Sermón De divite feneratore, Trcatatus in Evangelium Iohannis, De Poenitencia, De concordia fratrum, Poentientes sermonus, De moribus Ecclesiae Catholice*.

Additionally, there are four manuscripts dedicated to the Rule ACTo 85 Rule of Saint Augustine, ACTo 90 Rule of Saint Augustine, and ACTo 189 Rule of Saint Augustine and two other works related to his figure: ACTo 68, *Melliloquium* by Fray Bartolomé de Urbino (1472–1517), and ACTo 73, the *Life of Agustinus* (Bayerri 1962, pp. 615–18). We can also add the incunabulum of the *Sermo de Sancta Monica mater sancti Augustini, Calixtus, Sermo de conversione sancti Agustini, Sigibertus, In epistola ad Macedonium de beato Augustine* (1486) (Guitarte 1987, pp. 378–90).

The most important for its quality and significance is the codex ACTo 20, cataloged for the first time by Heinrich Seuse Denifle (1844–1905) and Émile Chatelain (1851–1933) in their *Inventarum codicum manuscriptorum Capituli Dertusensis* (1896) as No. 20 of the 12th century, *S. Augustini de Civitate Dei libri II-XXII*, which notes the absence of the first two booklets (Denifle and Chatelain 1896, p. 7). Subsequently, Josep Maria March i Batlles

(1875–1952) found four illustrations (fol. 1r–2v) (March 1916, pp. 351–54). Later, Jordi Rubió i Balaguer (1887–1982) and Ramon d'Alòs-Moner i de Dou (1885–1939) added the initial folios of the codex and the illustration (fol. 5r) (Rubió and Rubió 1914, p. 143).

In the current catalog, it is listed as ACTo 20, Saint Augustine, Bishop of Hippo: Of the City of God. It is a manuscript from the 12th century written on parchment, with 408 folios measuring 370 × 270 mm, and it is placed in a writing box with two columns measuring 280 × 210 mm with 33 lines (fol. 13r). It lacks part of the first book (Bayerri 1962, pp. 157–59). It contains five illustrations cited as follows: the Zodiac (fol. 1r), the Defense of the City of God (fol. 1v) (Figure 4a), the Celestial Jerusalem (fol. 2r) (Figure 4b), the *Maiestas Mariae* (fol. 2v) (Figure 4c), and the Creation (fol. 5r) (Ibarburu 1984, pp. 93–124). Additionally, it contains 21 initials that head each of the books except for XVIII (Ibarburu 1985, pp. 103–25). In the review through *Les manuscrits à peintures de la Cité de Dieu de Saint-Augustin* by Alexandre Laborde (1853–1944) with 61 illuminated codices, we can relate the Zodiac (fol. 1r) with the reference from Mss. Franc. 900S-9006, fol. 287v, which is from the Royal Library of Brussels (c. 1410), illustrating that Book VIII is dedicated to natural theology (Laborde 1909, p. 322).

(a) **(b)** **(c)**

Figure 4. ACTo No. 20, 12th century. (**a**) fol. 1v, Defense of the City of God; (**b**) fol. 2r, Celestial Jerusalem; (**c**) fol. 2v, *Maiestas Mariae*. Image authors granted reproduction permission.

The Defense of the City of God (fol. 1v) (Figure 4a) bears some resemblance to the illustrations of Book I, depicting the sack of Rome by the Goths and showing how God's mercy tempered the destruction of the City (BnP, Ms. Franc. 22912-13) (c. 1376) and (Ms. Add. 1 5244-45) from the British Museum (1370–1377) (Laborde 1909, p. 191)). The image of Celestial Jerusalem (fol. 2r) (Figure 4b) resembles that of the Heavenly City from Ms. lat. A. 7, fol. 1v of the Metropolitan Chapter Library of Prague's illustration of Book I (Laborde 1909, Plate IV). The *Maiestas Mariae* (fol. 2v) (Figure 4c), for which we have no direct reference in the cataloging and which is long considered an Assumption, can be read as an allegory of the Church by virtue of the hierarchical arrangement of Christ, the Virgin, and below them, a figure with a pastoral staff and a book, perhaps St. Augustine, is surrounded by faithful and disciples (Grimaldi 2015, pp. 77–90). The Creation (fol. 5r) could illustrate Chapter 21 of the Creation of the first man and the human race from Book XII, reflected in a large number of codices (Laborde 1909, pp. 193–95).

On the other hand, the architectural layout of the illustrations of the City of God and Celestial Jerusalem (Figure 4a,b) brings us closer to the collection of graphic representations of architecture in the *Livre de portraiture* (c. 1220–1240) by Villard de Honnecourt (c. 1200–c. 1250) from (BnP, Ms Fr 19093), which consists of 33 parchment folios (0.230 × 0.240)[12].

Likewise, the vegetal forms and the bestiary depicted in the Zodiac (ACTo 20 fol. 1r) in the representations of Aries, Taurus, Leo, or Capricorn (Figure 5a) bring us closer to the bear and the swan, a figurative representation of Celestial Jerusalem from (BnP, Ms Fr 19093, fol. 4r) (Figure 5b). The *têtes de feuilles* and the vegetal ornaments (BnP, Ms Fr 19093, fol. 5v) (Figure 5c) bring us closer to the scrolls alternating with foliar motifs, which are symmetrical and heart-shaped motifs from (fol. 1r). The human figures of the Creation of Adam and Eve (Figure 6a) bring us closer to those in (BnP, Ms Fr 19093, fol. 29v) (Figure 6b), an ancient representation of Mercury; to the birds and marine animals of the creation of the fifth day and the terrestrial ones of the sixth day (Figure 6c); and to the lion (BnP, Ms Fr 19093, fol. 24v) (Figure 6d) and eagle for reading the gospel (BnP, Ms Fr 19093, fol. 7r) (Figure 6e).

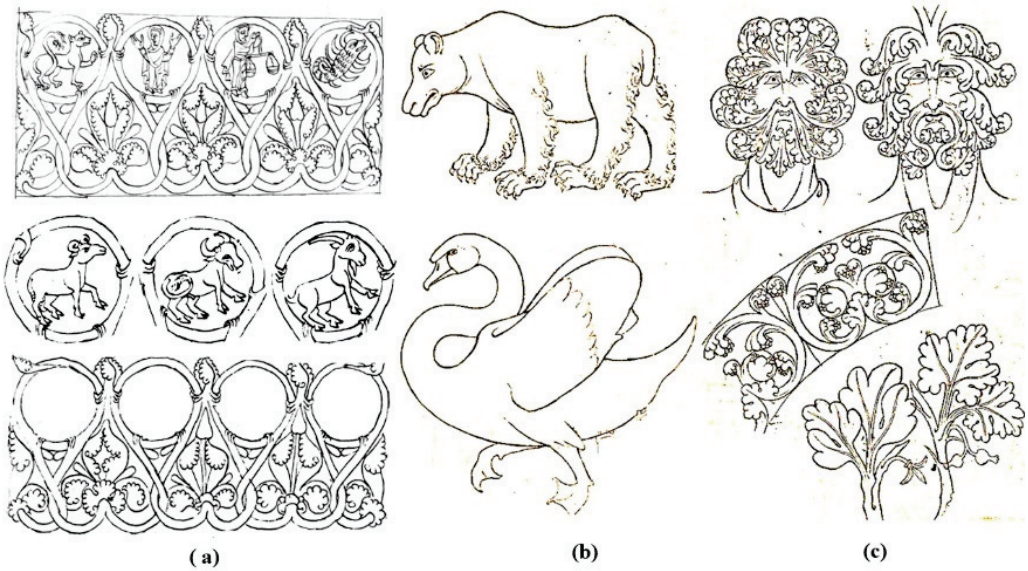


Figure 5. ACT 20: (**a**) representation of Zodiac. BnP, Ms Fr 19093, (**b**) "les têtes de feuilles"; (**c**) vegetal ornaments[13].

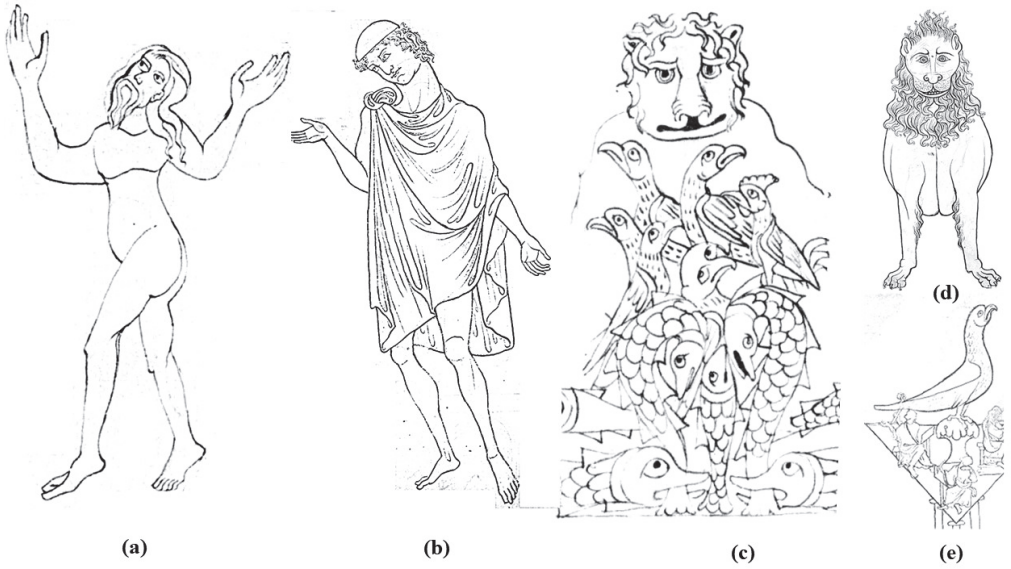


Figure 6. Human figures: (**a**) ACTo 20; (**b**) BnP, Ms Fr 19093. Marine and terrestrial animal figures: (**c**) ACTo 20; (**d**) BnP, Ms Fr 19093[14]; (**e**) BnP, Ms Fr 19093, fol. 7r.

3. Methodology and Results of Terrestrial Laser Scanner (TLS)

The basic pattern of measurements appearing in the Llibres d'Obra [ACTo] is the *cana* of eight spans and the span of twelve fingers. The *cana* of Tortosa is defined in Book IX, No. 15.5 of the Consuetudines Dertosae (1272) [AHCTE: cod. 53, fol. 256r][15]. By comparing the unifying documents of the *cana* of Tortosa with that of Barcelona (24-VII-1593), we concluded that the *cana* of Tortosa used for the cathedral measures 1.858 m, and the span is 0.2323 m. The methodology proposes a comparative reading of these measurements with the data obtained through a survey conducted using a Leica Scan Station C10 with an accuracy of 4 mm at 50 m and angular accuracy of $12''/12''$ (Figure 7).

Figure 7. An image resulting from the terrestrial laser scanner (TLS) survey of the apse of the Tortosa Cathedral.

The total error of the methodological process (Et) is the sum of the evaluation of the uncertainties of the work (Ei), the observation and data collection (Ed), the computer processing of these points (Et), and those derived from the appreciation of the layout of the work (Er), for which its value (Et = $\pm$0.083 m) and calibration with respect to the three canes of Tortosa represent an error of $\pm$1.502% with respect to this pattern. The most characteristic values of the data obtained from the apse are statistically analyzed so that the relative error (e_r) will be equal to the most probable value (c_a) plus or minus the root mean square error of the mean (c_{cm}).

After the statistical analysis of the data carried out by the *magister operis*, possible connections of the sources that inspired this *fabrica* by the Chapter are sought in the existing works of the ACTo. The outline of Guarc (Factory—No. 49) (c. 1345–1380) (0.917 $\times$ 0.682 m) (Figure 8a) is preserved, representing the plan of a project of the apse and part of the body of a cathedral nave, with an annexed chapel with exterior access. On the parchment, a base of auxiliary lines is observed prior to the final outlines (Figure 8b), for which its analysis allows for the establishment of an interpretative methodology of the geometric layout of the apse (Figure 8c) (Lluis i Ginovart et al. 2013, pp. 325–48).

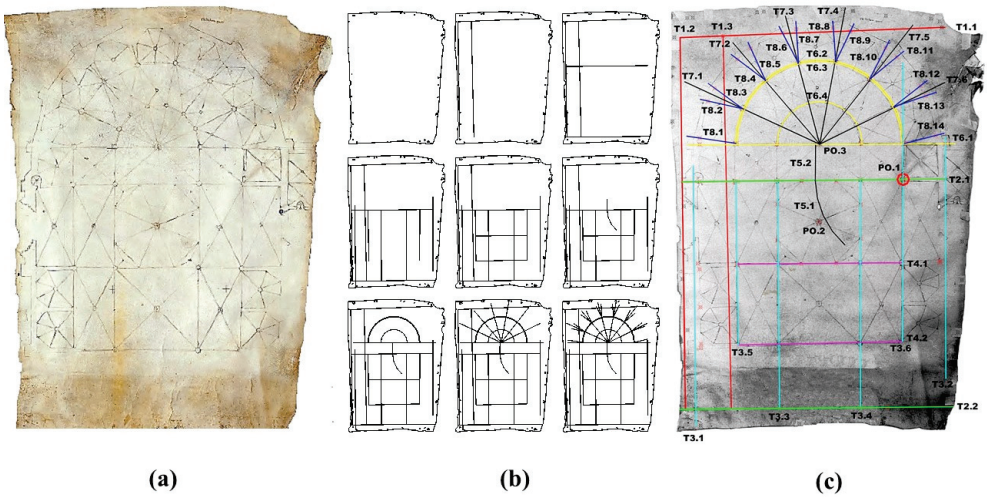


Figure 8. (**a**) Parchment *Mostra d'En Antony Guarç, ACTo Factory—No. 49*; (**b**) graphic transcription of the parchment's auxiliary lines; (**c**) metric of the apse layout.

3.1. The Metrology of the Floor Plan of the Apse

The apse with a double ambulatory was built between 1374 and 1441, embracing and replacing the previous Romanesque cathedral from the outside. The first phase (1383–1424) involved the construction of the belt of radial chapels, executed in a sequential manner (Figure 9a–c). The second phase determined the construction of the ambulatory (1424–1434) symmetrically covering the axis of the presbytery (Figure 9d–f), which is balanced on the *pilar major* (Figure 9d). Finally, the closure of the presbytery (1435–1441) occurred with the first placement of the keystone on the main pillar (1439) (Figure 9g) and the subsequent construction of the vaults (Figure 9h).

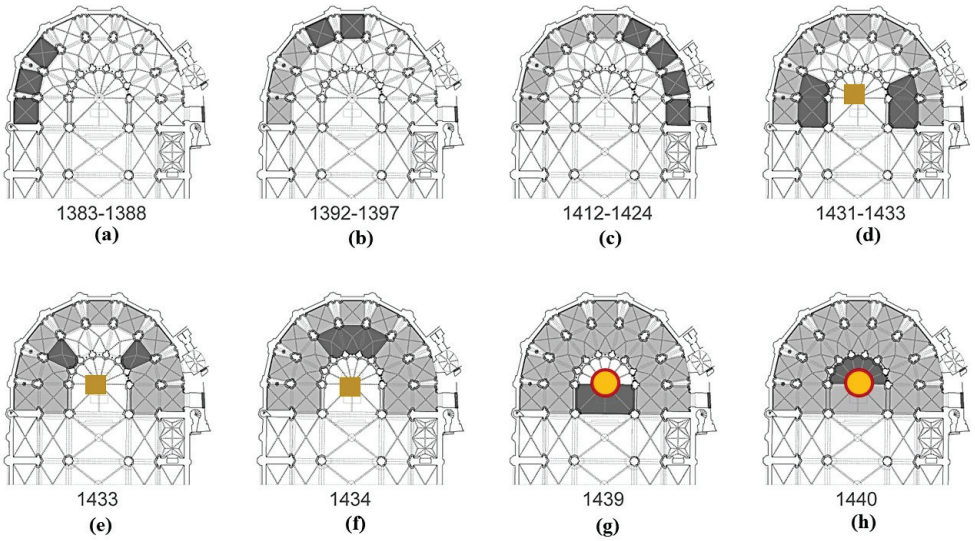
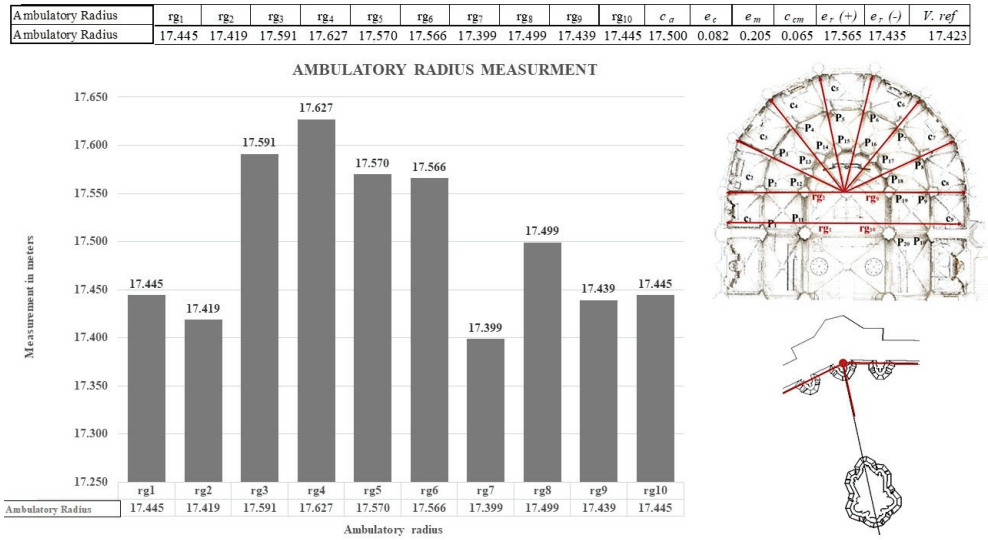


Figure 9. An analysis of the constructional evolution of the vaults of the apse of the Tortosa Cathedral (1374–1441); (**a**–**c**) (1383–1424); (**d**–**f**) (1424–1434); (**g**,**h**) (1439–1441).

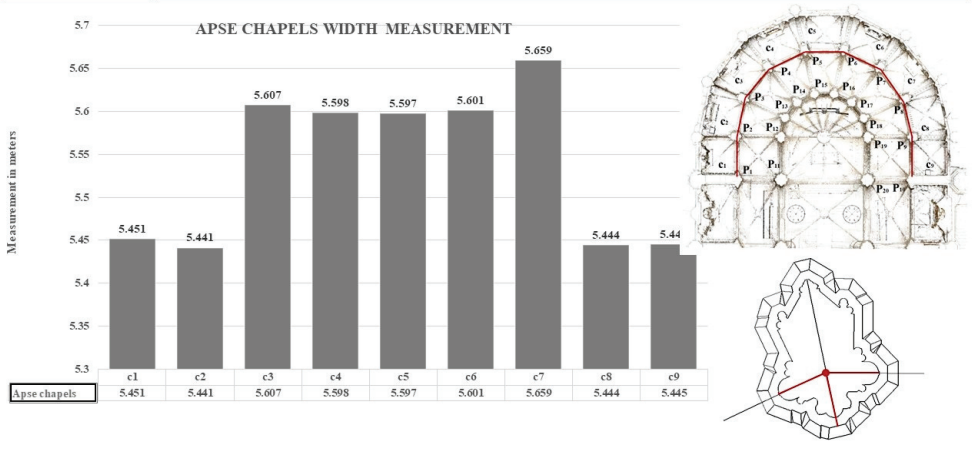
The total width of the ambulatory is the statistical value of the inner face of the enclosing wall, obtained as the most probable value c_a(rg1–10 = 17,500 m) with a root mean square error of the mean (c_{cm} = 0.065 m), resulting in an interval [17.565–17.435 m] within the reference value (17.423 m), which is equivalent to 75 spans (Figure 10) (Appendix A, Tables A1 and A2).



Ambulatory Radius	rg_1	rg_2	rg_3	rg_4	rg_5	rg_6	rg_7	rg_8	rg_9	rg_{10}	c_a	e_c	e_m	c_{cm}	e_r (+)	e_r (-)	*V. ref*
Ambulatory Radius	17.445	17.419	17.591	17.627	17.570	17.566	17.399	17.499	17.439	17.445	17.500	0.082	0.205	0.065	17.565	17.435	17.423

Figure 10. A statistical analysis of the radii of the ambulatory: terrestrial laser scanner (TLS).

To determine the measurement of the nine radial chapels ($c_1 \ldots c_9$) and reviewing the auxiliary lines of Guarc's parchment (T6.2) and (T6.3), the most probable value is ($c_{a(c1–9)}$ = 5538 m). The root mean square error is e_c = 0.090 m, resulting in a relative error ($e_{r(c1–9)}$) with a range of 5.613–5.463 m. Similar results are obtained with the seven radial chapels (c_2–c_8), where the reference values yield a range of 5.645–5.483 m, close to 24 spans (5.575 m), which are three *canas* (Figure 11). The centers of the presbytery pillars (P_{11}–P_{20}) and the 10 radii (rp_1–rp_{10}) are situated at a most probable distance of c_a = 6249 m, with a relative value between the range of 6.278–6.219 m and within the measurement of 6.272 m; they have 27 spans, which is half of the 54 spans of the radius where the radial chapels are traced (Figure 12). The centers of the pillars P_{12} y P_{19}, homologous to the new designs of (P_{11}–P_{12}) and (P_{19}–P_{20}), with displacements P_{11} and P_{12}, are 0.107 m and between P_{19} and P_{20} (0.168 m).



Width of apse chapels	c_1	c_2	c_3	c_4	c_5	c_6	c_7	c_8	c_9	c_a	e_c	e_m	c_{cm}	e_r (+)	e_r (-)	*V. ref*
Apse chapels	5.451	5.441	5.607	5.598	5.597	5.601	5.659	5.444	5.445	5.538	0.090	0.225	0.075	5.613	5.463	5.575
Radial chapels		5.441	5.607	5.598	5.597	5.601	5.659	5.444		5.564	0.086	0.214	0.081	5.645	5.483	5.575

Figure 11. Statistics of the width of the chapels in the apse: terrestrial laser scanner (TLS).

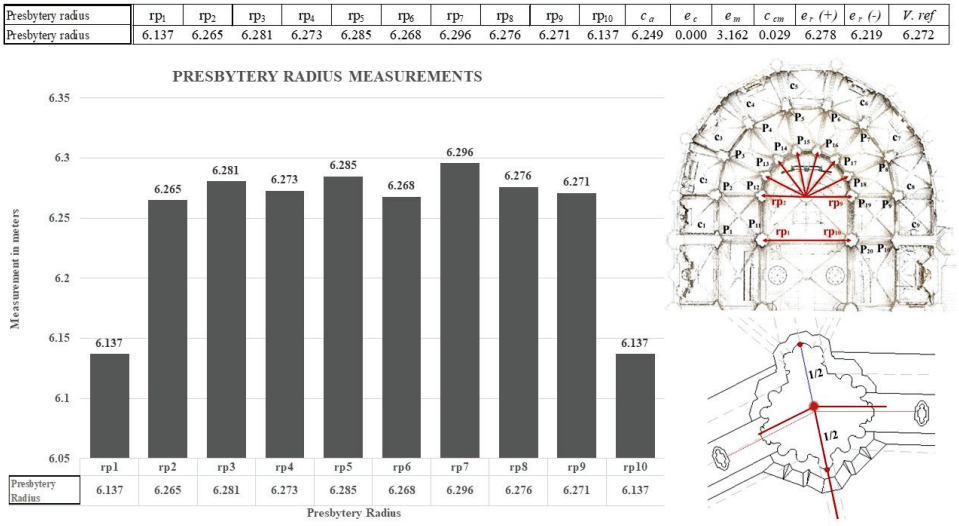


Figure 12. Presbytery radius statistics: terrestrial laser scanner (TLS).

3.2. The Metrology of the Section of the Apse

To determine the measurement of the height of the nine radial chapels ($c_1 \ldots c_9$), the zenith of the ribbed vault of the radial chapels (c_1–c_9) is taken as a reference, and it is located at the neck of the keystone, with the most probable value of the chapels ($h_{ca(c1–9)}$ = 10,469 m) obtaining a relative error ($e_{r(c1–9)}$) in the range of 10.581–10.357 m. The range of the statistical result falls within the metrological measurement of 45 spans (Figure 13) (Appendix A, Tables A1 and A2).

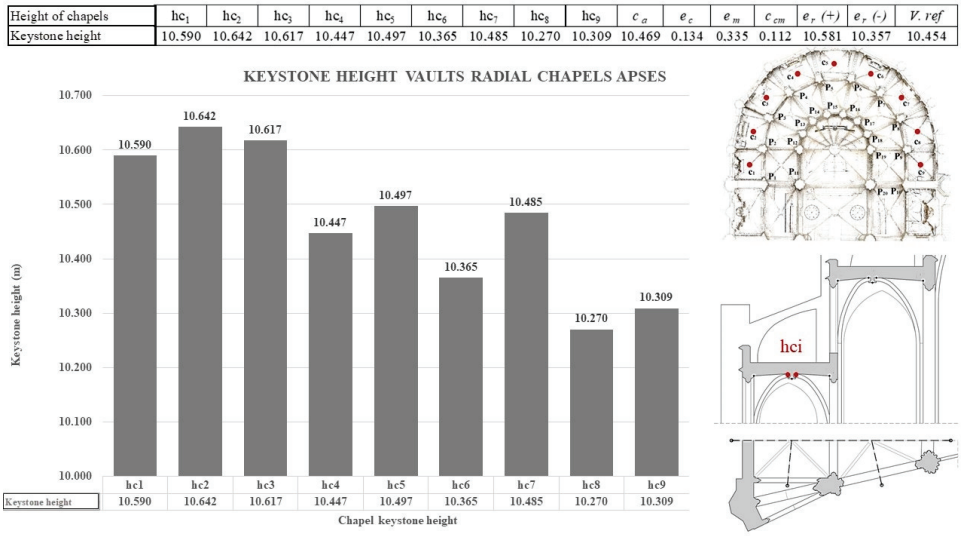


Figure 13. A statistical analysis of the height h_{ci} of the radial chapels in the apse (TLS).

The height of the nine vaults of the ambulatory ($h_{d1} \ldots h_{d9}$) has a most probable value ($h_{da(c1–9)}$ = 16.007 m). The relative error ($e_{r(c1–9)}$) ranges from 16.070 to 15.940 m within the range of 69 spans, and it is close to 70 spans, which is within the methodological error (Figure 14). The section of the presbytery vault does not have a direct measurement since the presbytery keystone casts a shadow over the neck of the constructive element. Taking references from the points (TLS), knowing point A (22.908 m), and given that the arch has a quarter section, we can deduce, by extending said arch, the keystone center, which would be situated at a height of 23.237 m above the presbytery floor. Taking a metrological value of 100 spans (23.230 m), a value similar to the indirect result determined by (TLS) is obtained, and it is where the keystone with the Coronation of the Virgin is located (Figure 15).

Vault of the ambulatory	hd1	hd2	hd3	hd4	hd5	hd6	hd7	hd8	hd9	ca	ec	em	ccm	er (+)	er (-)	V. ref
Keystone height	16.130	15.913	15.981	15.978	16.018	15.990	15.953	15.972	16.130	16.007	0.075	0.188	0.063	16.070	15.944	16.261

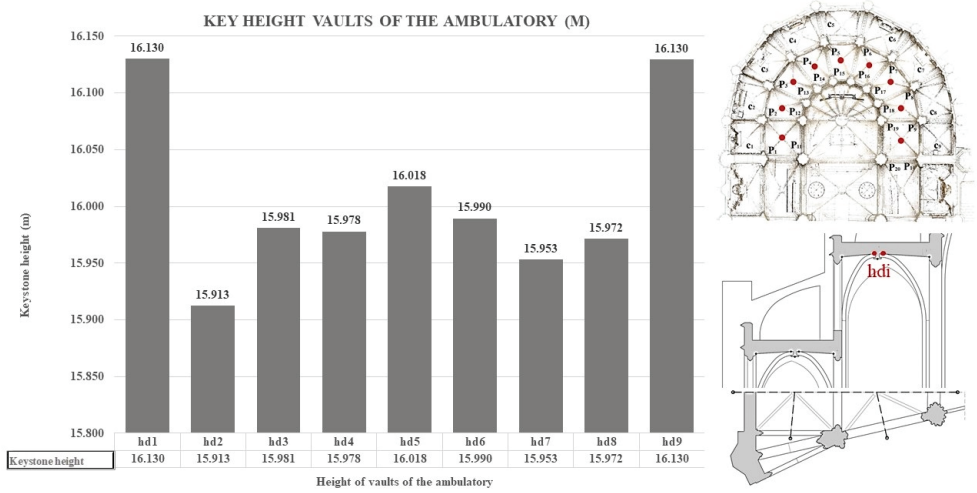


Figure 14. A statistical analysis of the height hdi of the vaults of the ambulatory (TLS).

Figure 15. The main keystone of the apse of the Tortosa Cathedral (1346–1441). Image by the authors.

Analyzing the height of the radial chapels (45 spans) in relation to the proportionality of the Gothic section theory with respect to the metrology of the floor plan, it is observed that at the midpoint of the ambulatory ($27 + \frac{1}{2}\ 27 = 40.5$ spans), a proportion is formed between the height of the chapel and the ambulatory (45/81), expressing the development of a ratio of ($9 \div 5$) (Figure 16a).

The reference value of the ambulatory keystones [16.070–15.940 m] falls within the range of 69 spans. Considering that the layout of the plan for ($9 \div 5$) would need to be 58 + 1/3 spans, we observe that it is far from the value of the finish of the apsidal chapels. If we check for the ratio ($9 \div 6$), the height of the ambulatory vaults would need to be at 70 spans (Figure 16b,c). The main keystone is situated at 100 spans over a total width of 150 spans from the ambulatory (Figure 16d,e). With these values, we can propose a plan layout of the measurements [81–105–150 spans], elevated in height corresponding to 45–70–100 spans. The presbytery keystone representing the Coronation of the Virgin has a larger crown diameter of 2.030 ± 1.502% m, neck diameter of 1.625 m ± 1.502% m, and a height of 0.902 ± 1.502% m, with a total elevation of 1.280 ± 1.502% m. The section is 2.110 m^2 and has a volume of 3.640 m^3, with an apparent density of 26.90 kp/m^3 and a weight of 97.916 KN (9.8 Tn).

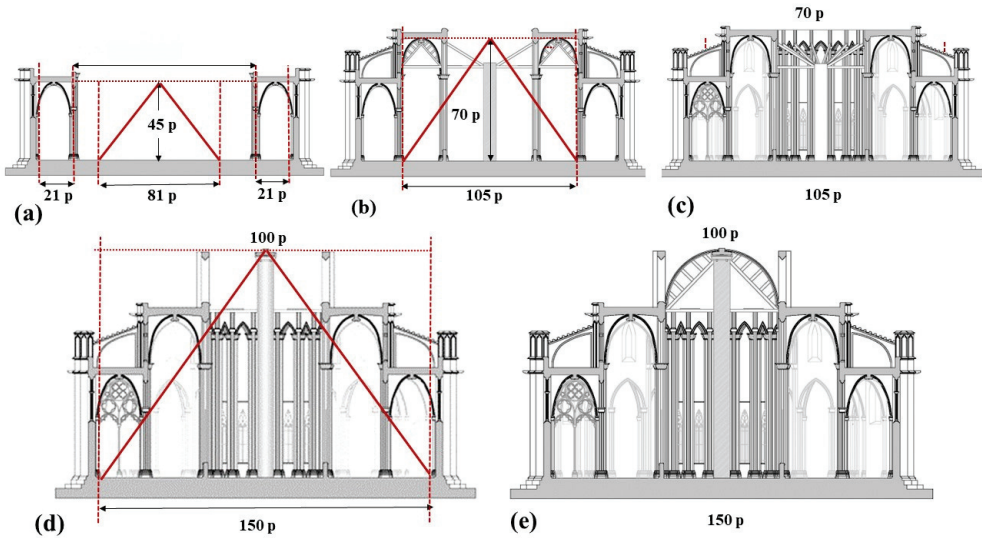


Figure 16. Section displays of the apse of the Tortosa Cathedral (1346–1441). Construction and proportional evolution of the apse; (**a**) radial chapels; (**b**,**c**) ambulatory; (**d**,**e**) placement of the keystone of the chancel.

4. A Discussion of the Results

In the design of a Gothic apse, the essential element is the determination of the number of chapels given that, on the one hand, they are the element of uniqueness that has its origin in the Gothic liturgy of the *Prochiron, vulgo Rationale divinorum officiorum* (1291), written by the Bishop of Mende, Gulielmus Durandus (1230–1296). This liturgy is known in Tortosa through ACTo 58 from the end of the 13th century and the incunabula of Rome (1477) (ACTo No. 258) and Venice (1482) (ACTo No. 290). On the other hand, the chapels are a modular element in construction as they allow for economic sponsorship and act as a buttress element (Puig i Cadafalch 1923, pp. 65–87). From a metric point of view, the radial and lateral chapels must be equal since they are part of the sequence of the pilgrimage that circumnavigates the apse (Font i Carreras 1891, pp. 9–14). In the case of Tortosa, as with the Augustinian canonical church of Girona, in 1312, nine chapels were built in its apse (Street 1865, pp. 318–39)[16], which was obligated by a contract, and seven of them are located within the perimeter of the circular crown of the presbytery; the other two are located on the axis of the existing Romanesque cathedral (Figure 17).

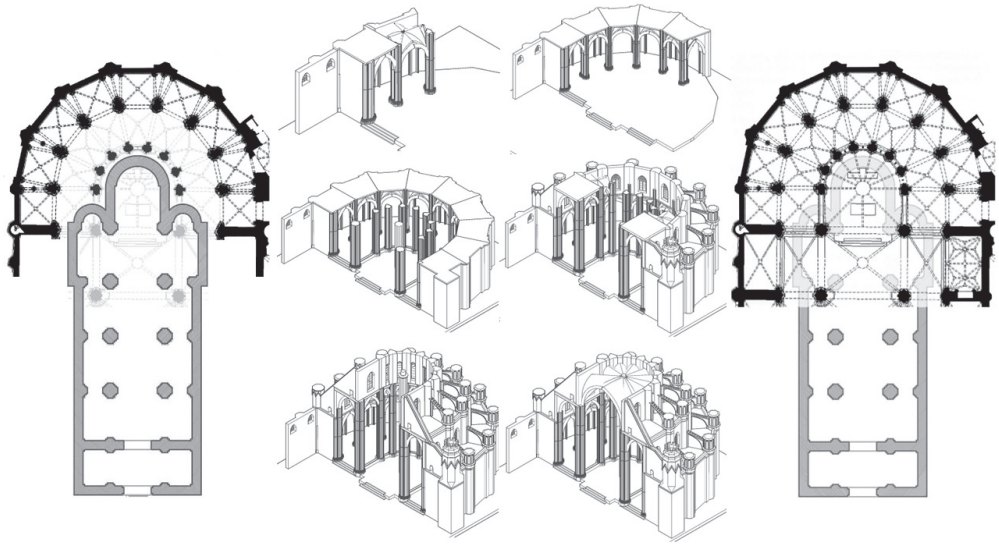


Figure 17. The constructional evolution of the apse of the Tortosa Cathedral (1346–1441).

4.1. The Metrology of the Apse and Augustine of Hippo

The magister operis had to solve three geometric problems: first, the utilization of a method for drawing the heptagon; second, constructing the geometric figure without knowing the center because it was occupied by the ecclesia vetulam; and finally, proportionally solving the relationship between the radial chapels and the two chapels in the straight section. In the bijective analysis, with respect to *theorica* y *practica*, which is the comparative reading between the construction and the ACTo, we have direct sources in the inventory of *De civitate Dei* [5], ACTo 20, *Supra Psalterium* [6]. We also have *Enarrationes in Psalmos* (Baiges 1999, pp. 3–20) and the *De Trinitate* (ACTo 55, fol. 1r–172r); the *De libero arbitrio* (ACTo 86, fol. 33v–59v); and the *De genesi ad litteram* (ACTo 86, fol. 59v–124v) (Denifle and Chatelain 1896, pp. 7–26).

The number seven does not appear in the early works of the *Soliloquia* (386) and *De ordine* (386). It is in the *De quantitate animae* (388) that he introduces it more and more into his discourse due to the influence that came to him through the catechesis for baptism and the sermons of St. Ambrose (340–397) (Cilleruelo 1953, pp. 510–11). In *De Civitate Dei* (ACTo 20), he refers to the number seven in relation to the seventh day as fullness and rest after Creation (*Civ Dei*. XI.31) (ACTo fol 168r–169v)[17]. On the seventh day, the same is seven times, and it manifests as God's rest and the sanctification of this day. The author warns that the first total odd number is three, which, together with four, forms the septenary.

In *De genesi ad litteram* (ACTo 86, fol. 59v–124v), the reference to the number seven is made through the number three, which is part of this number, along with eight and nine. Seven can be divided into three and four (*De Gen. ad Litt.* IV.2,2)[18]. In *Enarrationes in Psalmos* (392), it is related to the Ten Commandments, which are divided between the three that show love to God and the seven that show love to their neighbor (*Enr. Psal.* 32. 2, 6)[19].

Regarding the seven radial chapels, the figure of the heptagon, as recognized by Bovelles, does not appear in Euclid's "Elements". The *Elementa* as translated by Adelardo of Bath (1075–1166) in 1142 considers the layout of regular polygons in Book IV[20], but it fails to mention either the heptagon or the mathematical syntax in Ptolemy's (ca. 85–165) *Almagesto*, which was translated by Gerardo of Cremona (1114–1187) around 1175[21]. The heptagonal layout by means of geometrical instrumentation was first refuted by Kepler (1571–1630) in his *Harmonices Mundi, Libri V* (1619), in the Propositio. XLV (Kepler 1619, 32–40)[22], and later by Gauss (1777–1855) at the end of his *Disquisitiones Arithmeticae* in Section VII, Propositions 361–366 (Gauss 1801, pp. 454–63).

We know the methodology of constructing the heptagon through the *Geometria Deutsch* (1472), attributed to Hans Hösch von Gmünd (fl. 1472) (Heideloff 1844, pp. 96–97), and the *Geometria Deutsch* (1488) by Matthäus Roriczer (+c. 1495) (Roritzer 1999, pp. 56–60). In these works, the side of the heptagon is determined as the height of an equilateral triangle with a side equal to the radius of the circumference. This method has come down to us through *Underweysung der Messung* (1525) by Albrecht Dürer (1471–1528), a consequence of the corollary of the construction of the pentagon (LII.15) with a value of $\sqrt{3}/2$ (Dürer 1525, 26r–27v). The origin of this method can be traced back to the *Kitāb fī mā yaḥtāju al-ṣāni' min al-a'māl al-handasiyya* (c. 993–1008) (*Book on those geometric constructions which are necessary for craftsmen*) by Mohammad Abu'l-Wafa Al-Buzjani (940–998), and its reception in Latin Europe occurred through Ibn Yunus, Kamal al-Din (1156–1242) in the court of Emperor Frederick II (1194–1250) (Raynaud 2012, pp. 34–83). Guarc's method determines the diameter of the circumference through the side of the regular polygon and its ratio (18:8), unlike Euclid's "Elements," Book IV, where the side is a consequence of the inscribed circumference (Heath 1908, pp. 88–111). Knowing the measurement of the chapel (c_i) results in the determination of the ambulatory (4,5 c_i) (Figure 18a), or vice versa is also possible given the width (2 r_i) and the radial chapel (1/4,5 2r_i) (Figure 18b).

We can speculate about the geometric method that might have been used to replant the radial chapels based on Abu'l-Wafa's (c. 993–1008) approach, starting from the height of the triangle ($\sqrt{3}/2 = 0.866$), or other medieval approximations such as the 7:6 ratio provided by Gerbert of Aurillac (c. 950–1003) with a measurement of 0.8571 (Bubnov 1899, pp. 43–45). Gabriele Stornaloco in 1391 utilized [8:7] 0.875 (Ackerman 1949, pp. 84–111) or the 9:8 ratio of 0.889 provided by Antoni Guarc (c. 1345–1380). The relationship between the side of the tetradecagon (ci) and the radial axes of the ambulatory (rdi) is analyzed. The most probable values for the radial chapels ($c_{a(c2–8)}$ = 5564 m) and the radius ($c_{a(rd1–9)}$ = 12,553) have a relationship ($c_{a(c2–8)}$)/0.5 $c_{a(rd1–9)}$ = 0.886, which is closer to Guarc's resolution. The chapel has a statistical value of three canes and is situated over a radius of 54 spans. Guarc's ratio is mentioned in Macrobio's *Comentarii In Somnium Scipionis* in ACTo 236 (fol. 1r. 61v) with the term "epogdo" (9/8) (ACTo 236 fol. 36v), as well as in the translation and commentary of Plato's "Timaeus" by Calcidio (fl.350) where the epogdo is expressed as (1 + 1/8) (ACTo 80, fol. 150r–150v). This completes the issue with a fragment from Book VII of Marcianus Capella's "Geometria" (fl. 430) (ACTo 80, fol.160v–161r) where the commensurable measure is *rhētós*.

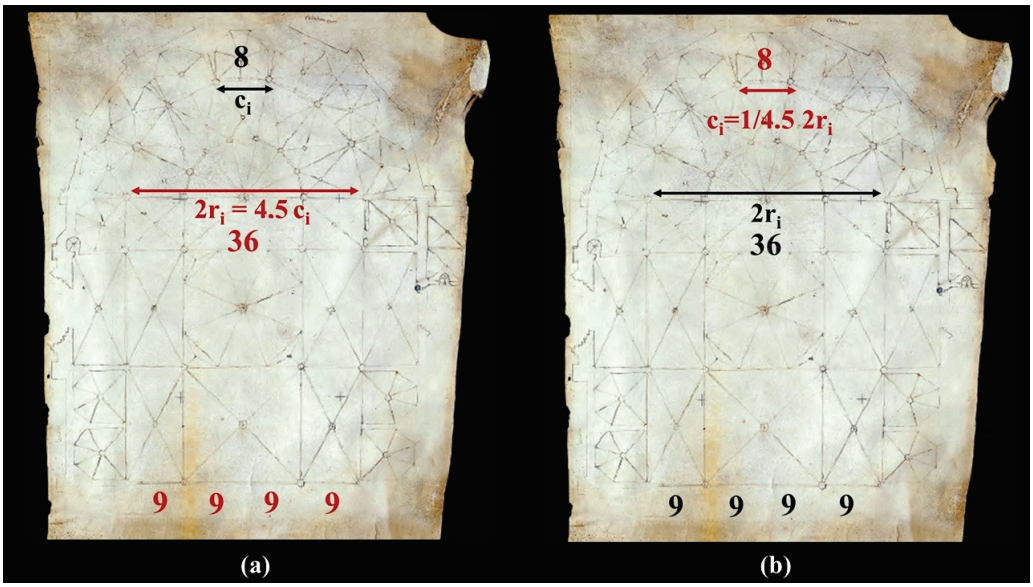


Figure 18. The arithmetic–geometric development of Antonio Guarc (ca. 1345–1380). (**a**) Knowing the average of the chapel, the width of the ambulatory is deduced; (**b**) Knowing the width of the ambulatory, the width of the radial chapel is known.

The centers of the pillars in the presbyteries (P_{11}–P_{12}) and (P_{19}–P_{20}) of the new design correspond to a radius of 27 spans, half of the 54 spans of the presbytery (2 × 27). In turn, the layout of the ambulatory was carried out at 108 spans (2 × 2 × 27), a measurement related to the number nine in Book XVIII (ACTo 20, fol. 294v–295r). This reference takes into account the number of the twenty-seven verses, defining this number as three raised to the cube since three times three is nine and in turn transforming it from width to height: three times nine is twenty-seven (*Civ. Dei* XVIII.23,2) (ACTo 20, fol. 295r)[23]. Nine is also referenced in "De Genesi ad Litteram" (ACTo 86, fol. 59v–124v) in relation to its divisors of three and six, recognizing the three parts of three, which is one-third of nine (*De Gen. ad Litt.* IV.2, 2)[24].

The width of the cathedral of 150 spans is determined using the statistical value of its radii (17.423 ± 0.065 m (17.423 m)), which is equivalent to 75 spans. At the end of the codex *Supra psalterium* [6] from a reference of the old inventory, which we have interpreted as *Enarrationes in Psalmos* in the commentary on Psalm 150, Augustine of Hippo provides a substantial apology for this number[25]. Firstly, he considers the number 15, from which 150 is formed, since the number 15 in relation to the simple numbers is a

relation of the number 150 with respect to the tens because it comprises fifteen times ten. The number 15 symbolizes the conformity of the two Testaments. In the Old Testament, the Sabbath is observed, which signifies rest; in the New Testament, the Lord's Day signifies resurrection. The Sabbath is the seventh day of the week and is Sunday, which immediately follows the seventh. The number 50 contains a great sacrament within itself, as it consists of weeks with the addition of one day, as if it were the 8th, which completes the number 50. Seven times seven results in the number forty-nine, to which one is added to form fifty. The number 50 contains great symbolism: Counting from the day of the Lord's resurrection, on the fiftieth day, the Holy Spirit came upon those who were gathered in Christ (*Enr. Psal.* 150, 1). He adds that 50 refers to penance, 100 to mercy and judgment, and 150 to the praise of God in His saints as we progress towards eternal life (*Enr. Psal.* 150, 3). A similar conception appears in the *Liber numerorum qui in sanctis Scripturis occurrunt* (612–615) (*Book of Numbers*) attributed to Isidore of Seville (c. 560–636), where this number takes on significance, through the Holy Scriptures, as a perfect number and of those who are predestined by God toward eternal life. (*Lib. Num.* 27,109)[26] (Pardillos 2000, pp. 285–304).

The metrological condition is based on the chapel with 24 spans (3 × 8 spans) and 3 *canas*, with a total width of 150 spans [21–27–27–27–27–21] (Figure 19a). Given that the radial chapels have a depth of 21 spans, the metrological construction is 3 × 7, 3 × 9, 3 × 9, 3 × 9, 3 × 9, 3 × 7 spans, allowing for the tracing of the apse without the circumference that inscribes it (Figure 19b). In the background, there is an intrinsic relationship between seven and nine, which is recognized in *De Musica libri sex* (387), in the numerical articulation of the half-feet: (2 + 2) + (2 + 1) = 7 and (2 + 2) + (2 + 3) = 9 (*De Mus.* V. 4, 7)[27].

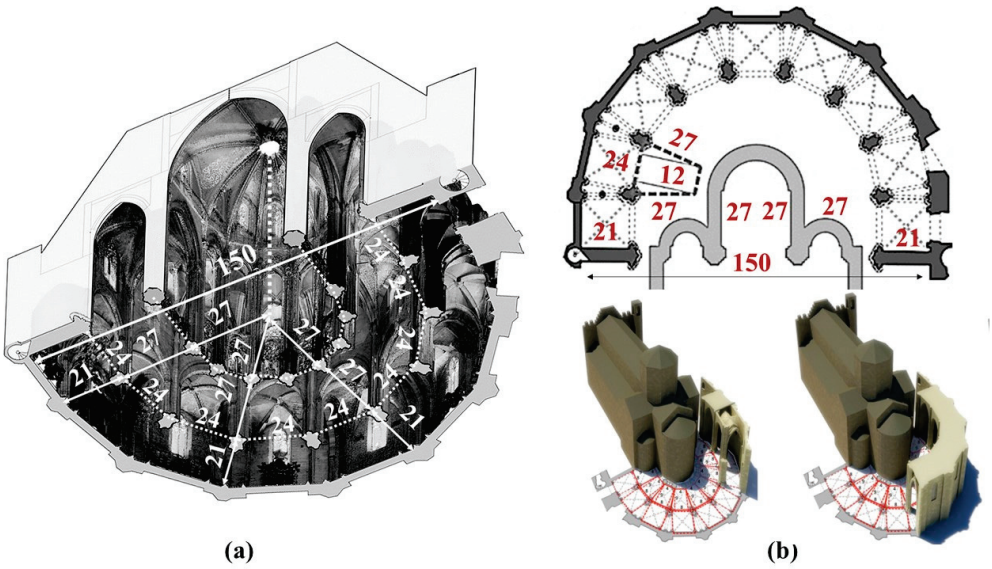


Figure 19. The layout of the apse of the Tortosa Cathedral (1346–1441). (**a**) Metrological construction of the apse of 150 spans with a radial chapel of 24 spans; (**b**) Polygonal layout of the ambulatory without the need to determine the center of the apse.

4.2. The Metrology of the Apse Section and Augustine of Hippo

Analyzing the height of the radial chapels (45 spans) in relation to the proportionality of the theory of the Gothic section with respect to the metrology of the floor, an initial relationship of (9 ÷ 5) is expressed. The reference value of the keys of the ambulatory [16.070–15.94 m] is within the range of close to 70 spans, with a floor layout of (9 ÷ 6). Finally, the main key is situated at 100 spans above a total width of 150 spans from the ambulatory relative to the base of the inner wall of the facade. With these values, we can propose a floor layout of the measurements [81–105–150 spans], elevated in height in a corresponding metrological manner to [45–70–100 spans] (Figure 20a). The evidence of a

change in proportionality of the model by Pascacio Xulbi (b. 1383–1441) and Juan Xulbi (b. 1416–1428) with respect to the initial model entailed a structural and visual change, where the image of the Coronation of the Virgin will not only have a central vision but will also visually preside over the chapels of the ambulatory in a centripetal manner (Figure 20b). At the change in section and the proportion 3:2, *sesquialtera* appears in the commentary of *Timaeus* by Chalcidius (fl.350) (ACTo 80 146r–155 v), as in *Comentarii In Somnium Scipionis* of ACTo 236 (fol. 1r. 61v) by Macrobius.

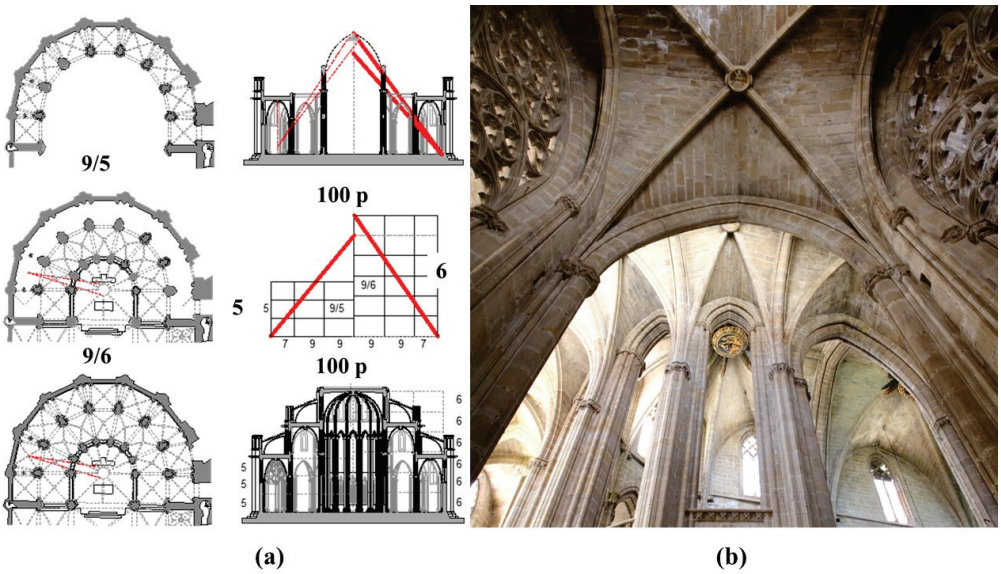


Figure 20. (**a**) The evolution of the apse section of the Tortosa Cathedral; (**b**) presbytery key from the radial chapels.

The *De civitate Dei* (413–426) addresses the judgment in Book XX (ACTo 20 fol. 333r–359r), dedicated to the two resurrections and the thousand years of the apocalypse (*Civ. Dei* XX.7) (fol. 337v–338v). It uses the thousand years to designate the duration of the world, employing it as the fullness of time. The number one thousand is the cube of ten, and ten times ten is one hundred. This is a flat figure, and to make it solid, it is necessary to multiply one hundred by ten, and we already have one thousand (XX.7, 2)[28]. The carving and roughing of the key attributed to Bartomeu Santalínia (b. 1420–1440) exhibit a neck (1.625 m ± 1.502%) within the range of 7 spans and a height (1.280 m ± 1.502%) within 5.5 spans, where the ten vaults and the eleven transverse arches converge. The crown of the ten angels surrounding it has a measurement (203.00 m ± 1.502%). Given the geometric difficulty of stone carvings, hypothetically, it could be thought to have had a diameter of ten spans such that the measurement of key 10, when multiplied by 10, is situated at 100 spans, and when it is multiplied by 10, it becomes 1000, representing the fullness of time.

The iconography of the Coronation of the presbytery corresponds to the enthroned Virgin, situated to the right of her Son (Puigarnau 2023, p. 914), who is being crowned with glory and honor and holds an orb in her hand (Hebrews, 2:9); she also exhibits a gesture of reverence before the King of kings and Lord of lords (Revelation, 19:16), both sharing the throne surrounded by ten angels held in their flight (Figure 21b).

(a) **(b)** **(c)**

Figure 21. (**a**) *Horae ad usum parisiensem* (1375–1425)[29]; (**b**) keystone of the Tortosa Cathedral; (**c**) *De civitate Dei* book XXII (s. XV)[30].

The Coronation of the Virgin concludes with the episodes of her Dormition and her Assumption into heaven, which are frequent themes in iconography attributed to Melito of Sardis (+c. 180)[31]. It was popularized in the passage Summa aurea (1261–1266) by Jacobus de Voragine (ca. 1229–1298), *Assumptio Beatae Mariae Virginis* Cap. CXIX, which states, "Come from Lebanon, you who are to be crowned." (Voragine 1999, pp. 479–83), and this was referred to in the 1420 cathedral's inventory: *Item, liber vocatus Flos sanctorum, in pergameno, in latino, qui fuit honorabilis domini decani Dominici Meseguer* [38]; *Item, Summa Aurea, in pergameno, cum littera minuta, spessa, cum cohopertis virmilis* [40]; and *Item, quidam liber vocatus Flos sanctorum* [48] (Baiges 1999, pp. 3–20). The image of the cathedral (Figure 21b) is consistent with the illumination of the *Horae ad usum parisiensem* (1375–1425) (BnP, NAL 3093-2, fol. 75v) (Figure 21a).

The Coronation also appears to illustrate Book XXII of *De Civitate Dei*, for which its object is the eternal happiness of the saints in order to attain the City of God, thus giving solidity to the faith in the resurrection of bodies, where it is also linked to the Final Judgment, given that the crown is of life (Revelation, 2:10) and where the purely human woman is the first to fulfill God's project for the divinization of man.

The ten angels surrounding the coronation appear in *De Civitate Dei* (BnF, Franc. 24 fol. 262v) (15th century) (Figure 21c), accompanied by bishops, the Pope, and the Saints. The keystone of the presbytery is protected by eleven winged dragons arranged on the crossing arches converging at the main keystone. The meaning of the dragon, symbolizing the combat to be overcome by Virtue, is that it is a protective element of the temple and the faithful who seek refuge in it (Figure 22).

The placement of the keystone took place with a Solemn Mass celebrated on 27 September 1439. The chosen date is the first Sunday after the forty days of the Assumption, which could have been better chosen by taking the *Legenda aurea* as a reference: "When my dormition occurred, all the apostles were by my side. They were precisely the ones who, with utmost reverence, carried my body to the tomb. Forty days after my death, I resurrected" (Voragine 1999, p. 482). The document says, "Today, Sunday, 27 September 1439, with the Altarpiece of the Cathedral open and well adorned, all the bells ringing, which had rung last night for the occasion... Here the office was performed, and the Mass very solemnly of the Assumption of the Virgin Mary" (O'Callaghan 1887, pp. 17–20).

Figure 22. The Coronation of the Virgin surrounded by eleven guardian dragons.

5. Conclusions

The Gothic cathedral of Tortosa, conceived from 1346 onwards, is the last of the Catalan Gothic cathedrals. Through the results obtained, its peculiar characteristics are visualized both in terms of its architectural order and its construction systems within the southern Gothic context. The principles in ecclesiastical replacement since 1155 by Bishop Godofredo (+1165) of *vivere sub regula Beati Agustini, et iuxta consuetudines Ecclesiae Sancti Ruffi*, render the figure of St. Augustine present both in intellect and in the iconography of the vault keystones. The abundant work still preserved in the eleven codices and thirty-two works is the greatest idolatry of the promoters of the cathedral. With the principle of numbers used as the ordering of creation by St. Augustine on the one hand and, on the other hand, the results obtained via quantitative methodology focused on the constructive reality analysis of the Tortosa Cathedral through close-range photogrammetry (CRP) and terrestrial laser scanning (TLS), it can be concluded that the construction was executed with great precision and with an error of less than 1.502%.

These direct sources coincide with the large dimensions of the cathedral: 150 span wide, 100 span high, and keystones measuring 10 spans in diameter, surrounded by 10 angels and the 7 radial chapels. The main works of Chalcidius and Capella (ACTo No. 80) and Macrobius (ACTo 236) also appear in this library. What is particularly interesting is the tonal ratio (9/8) of the epogdo used by Macrobius' *Comentarii In Somnium Scipionis*, who was the teacher of Augustine of Hippo and who appears in the codex (ACTo 236 fol. 36 v), and the ratio is used for the layout of the seven radial chapels. This thesis is in line with the principles of classical art historiography originating from Wilhelm Worringer (1911), Erwin Panofsky (1951), and especially Otto von Simson in Order (1956).

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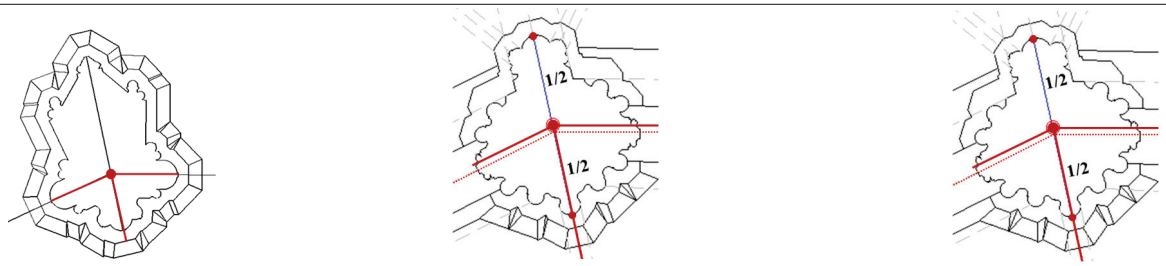
Abbreviations

ACTo	Archivo Capitular Tortosa
AHCTE	Arxiu Històric Comarcal Terre de l'Ebre
BAC.	Biblioteca Autores Cristianos Obras de San Agustín
BNE	Biblioteca Nacional España
BnP	Biblioteca Nacional Paris
(*Civ. Dei.*)	De civitate Dei (413–426)
(*Conf.*)	Confessionum, libri tredecim (397)
CRP	Close-range photogrammetry
(*De Gen. ad litt.*)	De Genesi ad Litteram libri duodecim (401)
(*De Mus.*)	Musica libri sex (387)
(*De Ord.*)	De ordine, libri duo (386)
(*Enr. Psal.*)	Enarrationes in Psalmos (392)
(*Lib. Num.*)	Liber numerorum qui in sanctis Scripturis occurrunt (612–615)
PL	Patrologia Latina. Jacques Paul Migne. Patrologiae Cursus Completus. Series Latina
TLS	Terrestrial laser scanner

Appendix A

Table A1. The measurements of the magnitudes of the pillars of the apse.

APSE PILLARS DIMENSIONS



Dimensions of Radial Chapel Pillars

Pillars	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
F ex/m,	1.049	1.923	1.992	1.980	2.004	2.002	2.010	2.002	1.896	1.046
F ey1/m,	2.387	0797	0.861	0.767	0.765	0.748	0.788	0.738	0.806	2.362
F ey2/m,		0.903	0.780	0.769	0.783	0.732	0.760	0.763	0.795	
F s, /m^2	1.611	1.677	1.755	1.742	1.769	1.684	1.787	1.709	1.681	1.593
B ex/m,	1.375	2.456	2.551	2.540	2.564	2.562	2.570	2.562	2.456	1.375
B ey1/m,	1.464	1.079	1.029	1.044	1.048	1.012	1.040	1.043	1.075	1.458
B ey2/m,	1.483	1.086	1.063	1.052	1.060	1.027	1.069	1.018	1.087	1.461
B s, /m^2	3.013	3.695	3.726	3.741	3.782	3.668	3.807	3.689	3.695	2.984

Table A1. *Cont.*

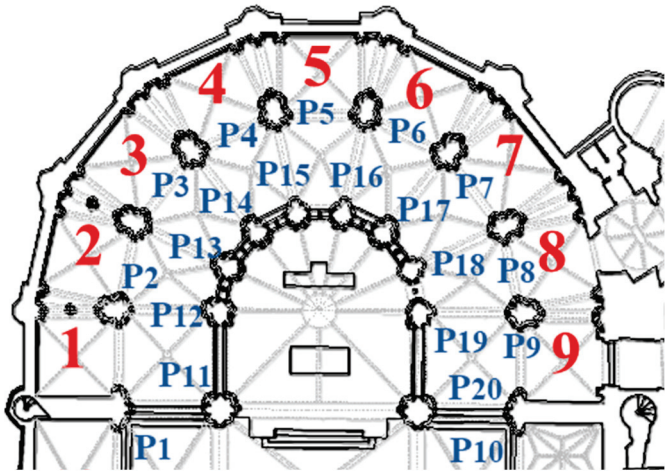
APSE PILLARS DIMENSIONS										
										
Dimensions of presbytery chapel pillars										
Pillars	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20
F ex/m	1.928	1.641	1.663	1.653	1.624	1.682	1.634	1.666	1.652	1.928
F ey1/m	0.964	0.966	0.756	0.75	0.774	0.77	0.776	0.744	0.758	0.947
F ey2/m	0.954	0.699	0.774	0.77	0.777	0.735	0.787	0.774	0.987	0.963
F s,/m^2	2.364	1.563	1.41	1.391	1.391	1.405	1.41	1.402	1.642	2.354
B ex/m	2.238	2.201	2.23	2.213	2.034	2.092	2.194	1.911	1.902	2.238
B ey1/m,	1.119								0.833	
B ey2/m,	0.954							0.849		1.118
B s, /m^2										

Table A2. The measurement of the layout in the plan of the apse.

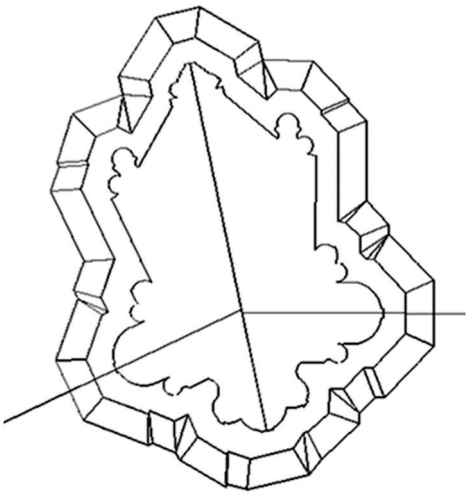
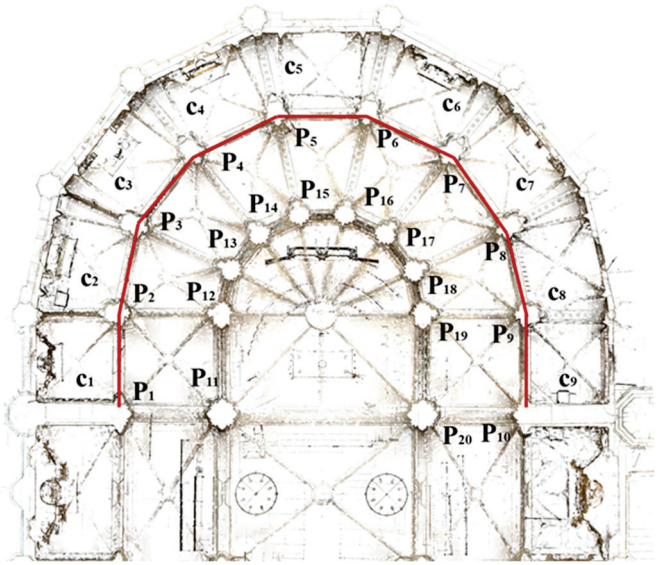
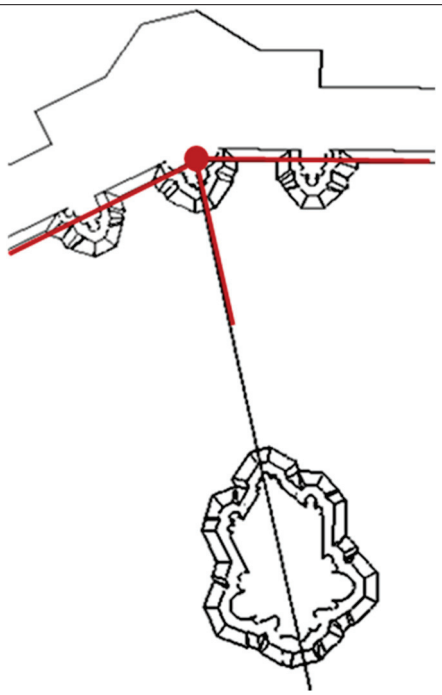
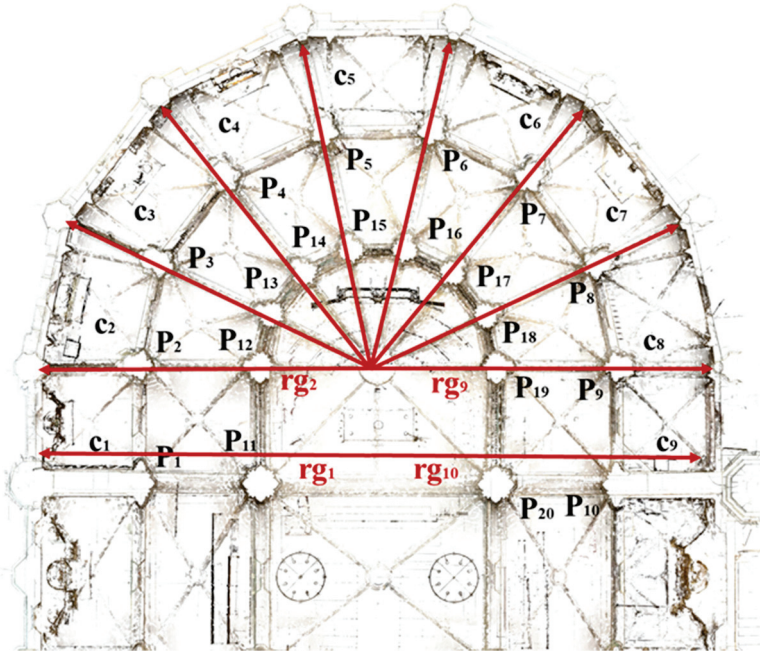
MEASUREMENTS APSE OF THE CATHEDRAL OF TORTOSA																
Chapels of the Ambulatory																
Width of apse chapels	c1	c2	c3	c4	c5	c6	c7	c8	c9	*ca*	*ec*	*em*	*ccm*	*er* (+)	*er* (−)	*V. ref*
Apse chapels	5.451	5.441	5.607	5.598	5.597	5.601	5.659	5.444	5.445	5.538	0.09	0.225	0.075	5.6132	5.463	5.575
Radial chapels		5.441	5.607	5.598	5.597	5.601	5.659	5.444		5.564	0.086	0.214	0.081	5.6448	5.483	5.575
																	

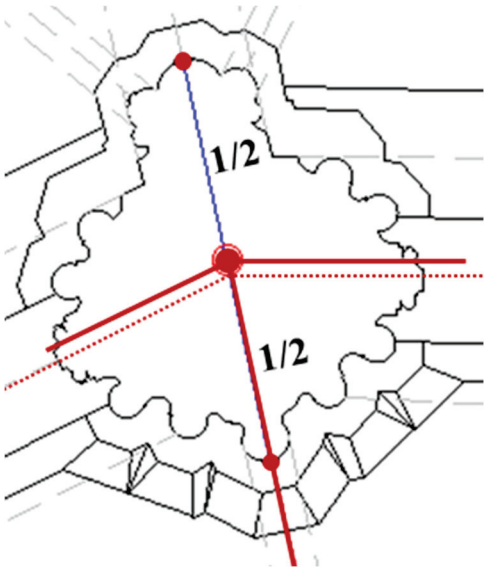
Table A2. *Cont.*

MEASUREMENTS APSE OF THE CATHEDRAL OF TORTOSA																	
Apse ambulatory radius																	
Apse ambulatory radius	rg_1	rg_2	rg_3	rg_4	rg_5	rg_6	rg_7	rg_8	rg_9	rg_{10}	c_a	e_c	e_m	c_{cm}	e_r (+)	e_r (−)	*V. ref*
Gyrola radius	17.445	17.419	17.591	17.627	17.570	17.566	17.399	17.499	17.439	17.445	17.500	0.082	0.205	0.065	17.565	17.35	17.423





Presbytery Radius																	
Presbytery radius	rp_1	rp_2	rp_3	rp_4	rp_5	rp_6	rp_7	rp_8	rp_9	rp_{10}	c_a	e_c	e_m	c_{cm}	e_r (+)	e_r (−)	*V. ref*
Presbytery radius	6.137	6.265	6.281	6.273	6.285	6.268	6.296	6.276	6.271	6,.37	6.249	0.000	3.162	0.029	6.278	6.219	6.272



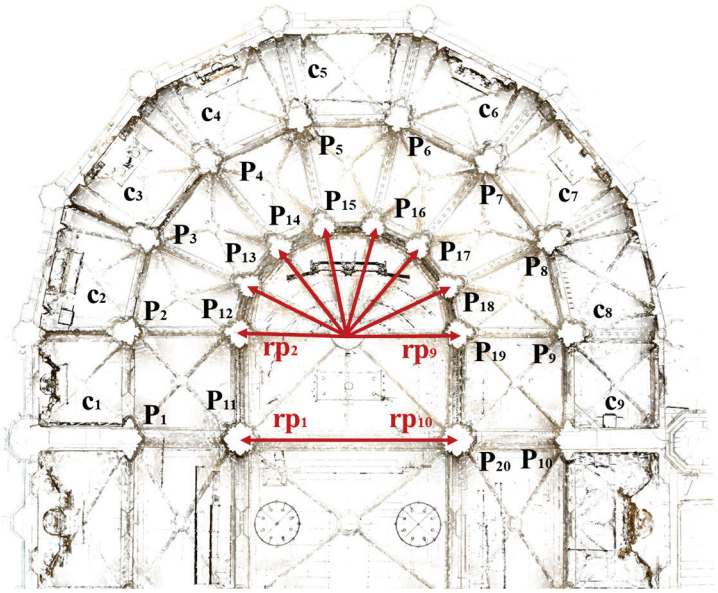
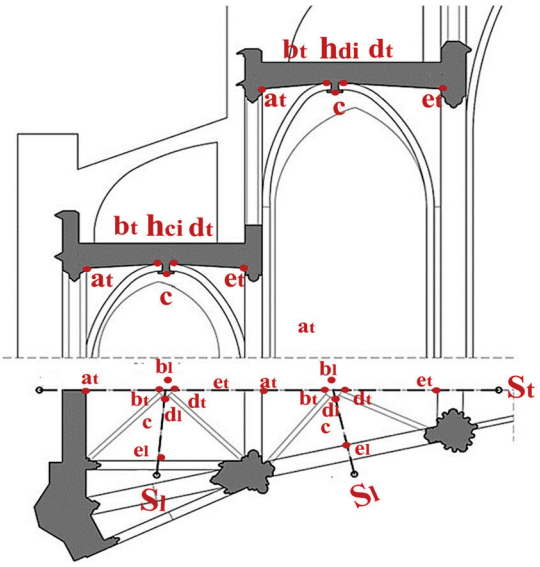


Table A3. The measurements of the section of the apse vaults.

APSE VAULT DIMENSIONS								
Radial Chapel Vaults								
Space	SECTION SL (Longitudinal)				SECTION ST (Transversal)			
Chapel	c	hci	a	e	c	hci	a	e
c1	10.192	10.590	10.358	10.231	10.192	10.590	10.277	10.240
c2	10.253	10.642	10.367	10.270	10.253	10.642	10.264	10.298
c3	10.245	10.617	10.378	10.163	10.245	10.617	10.336	10.283
c4	10.101	10.447	10.533	10.188	10.101	10.447	10.270	10.313
c5	10.093	10.497	10.475	10.235	10.093	10.497	10.364	10.359
c6	9.945	10.365	10.441	10.224	9.945	10.365	10.274	10.312
c7	10.084	10.485	10.409	10.314	10.084	10.485	10.270	10.314
c8	9.851	10.270	10.479	10.287	9.851	10.270	10.327	10.376
c9	9.900	10.309	10.475	10.178	9.900	10.309	10.443	10.303
								
Vaulting vaults								
Space	SECTION SL (Longitudinal)				SECTION ST (Transversal)			
Gyrola	c	hdi	a	e	c	hdi	a	e
d1	16.30	16.650	16.240	16.257	16.130	16.650	16.275	16.313
d2	15.913	16.439	16.252	16.323	15.913	16.439	16.289	16.310
d3	15.981	16.493	16.253	16.334	15.981	16.493	16.313	16.322
d4	15.978	16.498	16.291	16.334	15.978	16.498	16.336	16.374
d5	16.018	16.533	16.286	16.367	16.018	16.533	16.383	16.405
d6	15.990	16.500	16.306	16.342	15.990	16.500	16.440	16.342
d7	15.953	16.461	16.264	16.369	15.953	16.461	16.328	16.318
d8	15.972	16.479	16.290	16.342	15.972	16.479	16.317	16.312
d9	16.130	16.652	16.326	16.319	16.130	16.652	16.307	16.315

Notes

1 Indirect methods allow for the measurement of space; thus, it is possible to observe and measure points of the factory that are not accessible with high precision.

2 (Augustine of Hippo 1845, PL32 col. 1015; 1969, BAC3 678–679).

3 (Augustine of Hippo 1845, PL32 col. 968–969; 1969, BAC3 617).

4 (Augustine of Hippo 1845, PL32 col. 705; 1958a, BAC2 185).

5 (Augustine of Hippo 1845, PL32, col. 1014; 1969, BAC1 676).

6 (Augustine of Hippo 1845, PL32, col. 1001; 1969, BAC1 647–648).

7 (Augustine of Hippo 1865a, PL34, col. 299–300; 1957, BAC15 731).

8 (Augustine of Hippo 1845, PL32, col. 1014; 1969, BAC1 678–679).

9 (Agustín de Hipona 1845, PL32, col. 1254; Augustine of Hippo 1962, BAC3 285).

10 The concept of love in St. Augustine, from its double dimension known as the love of use (uti) and the love of enjoyment (frui), (López 2016, pp. 104–25.)

11 Bouvelles, Tractatus varii de rebus philosophicis, conserved in Tortosa ACTo. 300. The compilation has two parts; the first part, of a scientific philosophical nature, is composed of Liber de intellectu, Liber de sensu, Liber de nichilio, Ars oppositorum, Liber de generatione, Liber de Sapient, Liber de duodecim numeris, and Epistole complures. The second part is dedicated to mathematics, numbers, and polygonal figures: Insup mathematicuopus quadripartitu, De Numenis perfectis, De Mathematicis Rosis, De Geoemtricis Corporibus, and De Geometricis Suplementis.

12 BnP. Bibliothèque Nationale de París, Bibliothèque nationale de France. Département des Manuscrits, Français 19093, https://archivesetmanuscrits.bnf.fr/ark:/12148/cc482952 (accessed on 11 January 2024).

13 http://classes.bnf.fr/villard/feuillet/index.htm (accessed on 11 January 2024).

14 See note 13 above.

15 Felipe II (1527–1598) Cortes de Monzón (1585). Through Chapter 89 of the Courts of Monzón (1585) King Philip II (1527–1598) unified the metric criteria. The prosecutors of Tortosa, under oath on 24 July 1593, refer to the documentation about the reduction in the cana of Tortosa to Barcelona. This is a noted example.

16 Capitulum Gerundense more solito congregatum statuit, voluit et ordinvit, quod caput ipsius ecclesiae de novo construeretur ethadificaretur, et circun circa ipsum caput, novem capellae fierunt et in dormitorio veteri, fierit sacristia. This is a noted example.

17 (Augustine of Hippo 1864, PL41 col. 644–645; 1958b, BAC16 769–771).

18 (Augustine of Hippo 1865a, PL34, col. 206–207; 1957, BAC15 723).

19 (Augustine of Hippo 1865b, PL36 col. 281–282; 1964, BAC19 432).

20 Euclid, Elements, Book IV; the triangle (IV.5), the square (IV.6 to 9), the pentagon (IV.11 to 14), the hexagon (IV.15), and the fifteen-sided polygon (IV.16) in the first edition, (Heath 1908, pp. 88–111).

21 Figure of the square, pentagon, hexagon, decagon, and dodecagon: see book I, (Toomer 1984, pp. 35–74).

22 This is a noted example. Johannes Kepler raised the problem of the constructability of the heptagon with a straightedge and compass in the fifth book of his *Harmonices mundo* (1619). There, he argued that the figure is not an entity capable of being known, since its formal description is impossible. It therefore can be constructed neither by the human mind nor in the infinitude of God, the Creator. Kepler's work had an inquisitorial response from the Dominican friar Ignacio Munoz Pinciano (ca. 1608–1685), who published the *Manifiesto Geométrico* (1684), (Lluis i Ginovart and Lluis-Teruel 2023, pp. 108–17).

23 (Augustine of Hippo 1864, PL41 col. 580–581; 1958b, BAC16 1282–1283).

24 See note 18 above.

25 (Augustine of Hippo 1865c, PL37 col. 1960–1964; 1967, BAC22 920–927).

26 (Isidoro de Sevilla 1862, PL82 col. 200).

27 (Augustine of Hippo 1845, PL32, col. 1149–1150; 1988, BAC32 254–256).

28 (Augustine of Hippo 1864, PL41 col. 667–668; 1958c, BAC16 1457).

29 https://portail.biblissima.fr/fr/ark:/43093/mdata340381b339947a844b4603a423bed7f8994228d8 (accessed on 11 January 2024).

30 https://portail.biblissima.fr/fr/ark:/43093/ifdata6444c40b2504672da19c58928e874dd777e9b78c (accessed on 11 January 2024).

31 (Pola 2003, p. 48).

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A Re-Examination of the Sources of Inspiration of Ethiopian Concentric Prayer Houses: Tracing an Architectural Concept from the Roman and Byzantine East to Islamic and Crusader Jerusalem to Solomonic Ethiopia

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Abstract: During the first millennium of Christian presence in Ethiopia (from the fourth century), church architecture was first in accordance with, and later partially based on, the basilica plan. Circa the early sixteenth century, a new and unique church plan appeared, circular, concentric, and with a square sanctuary, and became the dominant church plan in the northwestern Ethiopian Highlands. This church plan has been referred to in scholarship as an innovation, and its sources of inspiration have not yet been definitively established. In this article, I will argue that this plan is a culmination of a process with roots in the Late Antique and Medieval Holy Land, by which the concentric prayer house plan came to be associated with the Jerusalem Temple. This process transcended religious boundaries and is expressed in the religious architecture of three monotheistic religious traditions.

Keywords: Ethiopia; Solomonic Kingdom; religious architecture; religious studies; churches; Jerusalem; Jerusalem temple; Jewish–Christian–Islamic relations; medieval studies; Early Modern studies

1. Introduction: The Sudden Appearance of a Unique Church Plan

Christianity was first established in the Late Antique kingdom of Aksum (in modern-day northern Ethiopia and Eritrea) in the fourth century, with the conversion of this kingdom's ruler and elite. By the sixth century, it had become well established throughout this kingdom's core regions, a process reflected in the construction of churches in several Aksumite sites.[1] Aksumite church architecture was based on the basilica plan, the most prominent church plan of the Late Antique Roman–Byzantine world.[2] This is not surprising considering the many connections, ecclesiastic, commercial, and political, between this kingdom and the Byzantine realm. Christianity persisted in Ethiopia after the seventh–eighth century decline of the Aksumite kingdom, and throughout the Middle Ages, several types of church plans developed in the Ethiopian Highlands, almost all based, to varying extents, on their basilical predecessors.[3]

In the early sixteenth century, a new church plan was introduced that would revolutionize Ethiopian church architecture—rather than a quadrangular, basilica structure oriented to the east, this type of church was concentric, oriented inwards. It comprises a central, square sanctuary surrounded by two concentric aisles, with the exterior of the structure either circular or octagonal (Figures 1 and 2).[4] The significance of this architectural revolution is reflected in Marilyn Heldman's (2003, p. 739) assertion that "the distinctive centralized sanctuary arrangement appears to be an independent invention and is unique to Ethiopia. Considering the erudition of Ethiopian religious leaders and their respect for ecclesiastic tradition, this plan is likely to have been a bold innovation, supported by well informed patrons".

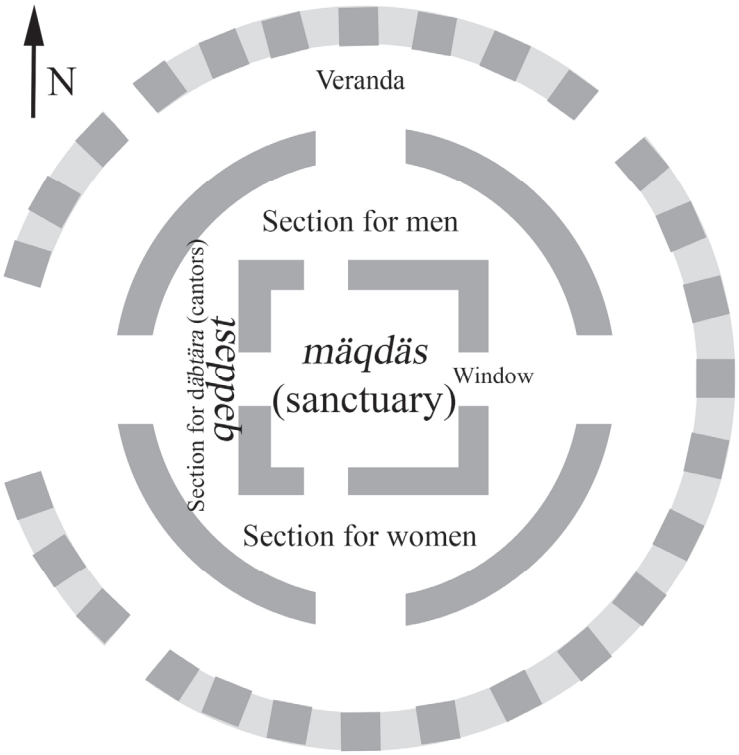

Figure 1. Schematic layout of a typical concentric circular Ethiopian church, based on (von Lüpke 1913, Figure 160). Note that some variants have an additional concentric aisle surrounding the sanctuary.

Figure 2. The church of Yəsḥaq Däbr in Wägära, built in accordance with the concentric circular plan.

In this article, we will endeavor to understand how and why this bold innovation came into being, gradually replacing its basilica-based predecessors as the most common type of church in the northern, and especially northwestern, Ethiopian Highlands. We will start by discussing the chronology of its appearance and reviewing the different suggestions offered so far regarding its sources of inspiration. We will then examine the history and symbolism of the concentric prayer house plan in the Late Antique and Medieval Holy

Land and argue that this symbolism is key to understanding the unique architecture of concentric Ethiopian prayer houses.

While Ethiopian churches in general, and Ethiopian church architecture in particular, have seen considerable research, past studies have tended to focus on Aksumite churches and their early medieval successors, as well as on the impressive church compound of Lalibäla, reaching its apex in the twelfth–thirteenth century.[5] Much of the research on later, concentric Ethiopian churches has been art historical in nature, focusing on the artistic decoration of such churches, their individual history, and the objects kept in the church compounds.[6] A few studies examine the architecture of these churches in detail and attempt to trace their origins. Notable among them are the studies of Fritsch (2018), Heldman (1992, 2003), di Salvo (1999), and Pérès (2006). The main suggestions raised in these studies regarding the sources of inspiration for the concentric Ethiopian church plan will be briefly reviewed below.

Past studies have thoroughly examined available textual, oral, and architectural evidence and compared Ethiopian church architecture and components with church architecture in other regions. But, so far, research on Ethiopian churches, and indeed, on Ethiopian Christianity in general, has focused, for comparative purposes, almost exclusively on Christian communities and culture. In this study, I will demonstrate that additional insight can be gleaned by "bringing into conversation" affiliated aspects of religious architecture and symbolism of non-Christian groups, both in Ethiopia and in the Middle East more broadly.[7]

1.1. When Did the Concentric Circular Ethiopian Church Plan First Appear?

Attempts to date the initial appearance of the concentric circular church type have been based primarily on textual accounts.[8] Fifteenth-century sources feature several descriptions of quadrangular Ethiopian churches, thus indicating that the concentric circular plan had not become widespread at the time.[9] The two earliest texts describing churches that can be securely identified with the concentric circular type are the accounts of the Portuguese soldier Miguel de Castanhoso, who was in Ethiopia in the years 1541–1543, and of the Jesuit missionary Manuel de Almeida (1579/80–1646). Castanhoso writes, regarding Ethiopian churches, that they are "round, with a holy place in the center, and all around outside are verandahs" (Whiteway 1902, p. 90). Thus, it seems that this church type was already widespread at the time.

Almeida describes the church dedicated to Mary at Amba Gəšän as round, with two rows of stone columns inside and a chapel in the center (Beckingham and Huntingford 2016, p. 99). The construction of the church in question was begun by the Solomonic monarch Naʿod (r. 1495–1508) and completed by the Solomonic monarch Ləbnä Dəngəl (r. 1508–1540). Almeida recalls that there was an unsuccessful attempt to burn down the church during the temporary Islamic conquest of the Solomonic Kingdom (1529–1543).[10] This implies that the circular church mentioned by him pre-dated this conquest. However, as pointed out by Fritsch (2018, p. 274), an Ethiopian chronicle relates that Amba Gəšän was destroyed during this conquest, raising the possibility that the church was rebuilt or substantially renovated afterwards (though the church is not explicitly mentioned in this account).[11]

It should be noted that hand-in-hand with the appearance of the concentric circular church type, pre-existing types of churches continued to be used, and some (such as the churches of Lalibäla mentioned above) continue in use today. It should also be noted that the concentric circular church was not the only concentric church type utilized in Ethiopia. A second type, to which we turn our attention now, is the concentric quadrangular church.

1.2. Concentric Quadrangular Ethiopian Churches

The concentric quadrangular Ethiopian church features a quadrangular prayer hall with a quadrangular sanctuary at its center.[12] Different variations of this plan exist. In some variants, a vestibule is built west of the prayer hall. Thus, elements of the structure's

layout are reminiscent of a basilica—a rectangular structure, oriented west-east, with a vestibule (narthex) leading into a prayer hall, while the prayer hall itself is concentric rather than divided into a nave and aisles as in basilica structures. In some cases, the sanctuary is square, while in others, it is rectangular, oriented west–east in accordance with the prayer hall.[13]

In some cases, prayer halls of pre-existing churches were fitted with a quadrangular central sanctuary, thus converting them into concentric quadrangular churches. One example is the originally basilical church at Asmära, the capital of Eritrea (Krencker 1913, pp. 195–98). A second (Figure 3) is the Great Temple at Yəḥa, dating from the first millennium BCE, which was probably first converted into a church in Late Antiquity and later fitted with a quadrangular sanctuary.[14]

Figure 3. The Pre-Aksumite temple at Yəḥa. A quadrangular, central century, built within its prayer hall, is no longer extant but was documented by the Deutsche Aksum-Expedition in 1906.

Addressing this church type and its development and relationship with the concentric circular type merits a detailed study and is beyond the scope of the present article. Fieldwork, together with a historical study aimed at dating all known examples of early churches with a central sanctuary in Ethiopia, would shed valuable light on the history and chronology of these church types and on the question of which type preceded the other. This question is of central importance for understanding the sources of inspiration of each individual type.

While both church types share a common feature, a quadrangular, central sanctuary, the circular type is a further step away from the basilical heritage of pre-modern Ethiopian church architecture, and hence represents the apex of the "bold innovation" of concentric Ethiopian church architecture. This innovation was not merely a matter of aesthetics. It had a profound impact on how the congregation experiences the liturgy.

1.3. The Liturgical Implications of the Concentric Plan

In earlier Ethiopian churches, based in part or as a whole on the basilica plan, the sanctuary is commonly located at the eastern end, across from the main entrance. The prayer hall, between this entrance and the sanctuary, afforded a clear view of the sanctuary area, which served as a main focal point of liturgy performance, though not of the sanctuary's interior, the most sanctified location. In concentric churches, the congregation gathers in parts of the ambulatory surrounding the sanctuary.[15] Thus, only part of the congregation can view the entrance to the sanctuary, and many congregants cannot see, but can only

hear, parts of the liturgy performed near this entrance. I would, therefore, argue that in concentric churches, the architectural aim shifts to a certain extent from accommodating the laity to accommodating the sacred. The sanctuary literally takes central stage, at the expense of affording the congregation a clear view of the liturgy.[16]

The replacement of temples by prayer houses in Late Antique and early medieval Europe and the Middle East caused a shift in the purpose of religious structures—these were no longer built primarily to serve the deity but rather to serve the congregation and to facilitate the liturgy. They became "Houses of Prayer" rather than "Houses of God". Instead of a temple that only priests would enter, in which the literal presence of the deity was believed to reside, with the congregation witnessing the offering of sacrifices in the courtyard, the prayer house was, in most cases, accessible to the laity. Accordingly, the central feature of the prayer house is its prayer hall. In this hall, the laity can take part in the liturgy or witness it from within the structure.

Thus, while the Ethiopian concentric prayer house is very much a "House of Prayer", it also assumes, to a certain extent, a quality of a "House of God". This is not only true of Ethiopian Orthodox churches. As I have demonstrated elsewhere, Betä Ǝsraʾel (Ethiopian Jewish) concentric circular prayer houses emulated the Jerusalem Temple to a greater degree than their Christian counterparts (Kribus 2023).

2. Suggestions Regarding the Emergence of the Concentric Ethiopian Church Plan

We now turn to examining the possible sources of inspiration for the concentric circular church plan in an attempt to trace its development and understand its symbolism. As stated above, several suggestions regarding the origin of this plan have been raised in scholarship, the most notable of which are outlined here.

2.1. Ethiopian Domestic Architecture as a Prototype

In the Ethiopian Highlands, especially in the regions west and south of Təgray, dwellings are typically built as circular structures.[17] Thus, it would make sense that a constructional technique that is familiar to the local population would be utilized to construct prayer houses, especially in rural areas devoid of considerable financial resources needed to build more elaborate churches.[18] It should be noted in this regard that there are documented instances of Ethiopian circular dwellings with a square chamber within them (von Lüpke 1913, pp. 34–40; di Salvo 1999, p. 77). This chamber divides the interior space into a main room surrounded by four smaller chambers. Thus, not only the circular concentric walls but also the square sanctuary could, in principle, be modeled after domestic architecture. Rather than asking how the architectural plan comprising a square chamber within a circular structure materialized in Ethiopia, we can ask why it was selected for the construction of prayer houses and what symbolic meanings it was endowed with in these religious structures.

It has been suggested that constructing circular churches, building on local constructional expertise, was an effective way to restore Ethiopia's Christian institutions in the wake of their destruction during the temporary Islamic conquest of Solomonic Ethiopia (Fritsch 2018, p. 287). It should, however, be noted that Castanhoso's above-mentioned sojourn to Ethiopia, during which he encountered churches that were "round, with a holy place in the center", began prior to the end of Islamic rule in the northern Ethiopian Highlands. Hence, the construction of circular churches could very well have intensified following the Islamic conquest but does not seem to have been triggered by it.

2.2. The House of the King as a Source of Inspiration

It goes without saying that in the endeavor to understand the symbolism reflected in a given structure, a first and crucial step is to turn, when possible, to the community that built and utilizes it. The terminology that the community uses to refer to the structure and its different components, as well as the ways in which it understands its symbolic meanings, provide valuable insight into the structure. Granted, concepts and terminology

can and do evolve with the passage of time, but just as prayers and other liturgical elements often retain elements of some antiquity, so too does religious terminology.

The concentric circular church type is known in Ethiopia as betä nəguś, i.e., the "House of the King", and is believed to have been modeled after the round houses of kings and noblemen.[19] Other aspects of the prayer house's terminology will be discussed below. It is notable in this regard that in the Early Solomonic Period, the royal court was, for long periods of time, a mobile court. The royal camp moved from place to place in order to maintain a royal presence in different parts of the realm, to ensure that no one region would need to provide sustenance for such a large population for an extended period of time, and to respond to political and military challenges. At the center of the camp was the king's tent, surrounded by the various functionaries and military units (Finneran 2007, pp. 254–59; Horvath 1969). Thus, the layout of the camp was concentric. Could this have contributed to the concept of a concentric layout for churches?[20]

2.3. A Circle as a Symbol

The circular shape has been attributed a symbolic value in numerous contexts and times. Among the themes it symbolized are the world and perfection. Indeed, the circular shape of Ethiopian churches has been compared to both these themes by Ethiopian ecclesiastics.[21] It has been suggested that this would have been a factor in selecting the circular shape as an appropriate form for a church. Interpretations in scholarship of the symbolic meaning of the concentric circular church include a meeting between the heavens, embodied by the circle, and the earth, embodied by the square (di Salvo 1999, p. 95; see also Fritsch 2018, pp. 286–87), and an advance towards the sacred, as one moves inwards from circle to circle, from the exterior through the concentric aisles (Pérès 2006, p. 161).

While it is more than likely that the square sanctuary was endowed with symbolism, I would argue that it is less likely that it symbolized the mundane world—the sanctuary is the holiest part of the church, containing the tabot (altar board), which symbolizes the Ark of the Covenant and the Tablets of the Law.[22] Hence, it stands to reason that its symbolism would be affiliated with the divine, and not with the mundane. Heldman (1992, p. 234) points out that the square form of the sanctuary in Ethiopian concentric churches corresponds with that of the Holy of Holies in the Jerusalem Temple, as outlined in biblical accounts (1 Kings 6:20; 2 Chronicles 3:8). This seems like a more likely source of inspiration, in accordance with other conceptual aspects of Ethiopian Orthodox concentric churches, which stress their affinity with the Jerusalem Temple (see below).[23]

2.4. Precedents in Nubian Church Architecture

One of the most significant qualities of the concentric circular church is that is concentric—i.e., that the sanctuary is located at its center. Fritsch (2018, pp. 287–92) suggests that the source of inspiration for the central sanctuary can be found in Nubian churches, specifically in the "Cruciform Church" at Dongola, the capital of the Nubian Kingdom of Makuria.[24] The construction of the church in question is dated to the ninth century, and it was destroyed during a Mamluk military raid in 1275. At its center is a square chamber, with four columns marking a smaller square within it, surrounding four additional columns which, it has been suggested, supported a ciborium (canopy). At the ends of the northern, western, and southern arms of the cross are doorways, while at the eastern arm of the cross, there is a synthronon (seats for the bishop and clergy), behind which is a closed chamber, under which is a tomb. Prior to the construction of the Cruciform Church, the tomb was incorporated in an earlier, basilica church built on the same spot (Godlewski 2013, pp. 49–52). The excavator, Godlewski (2013, pp. 39–41), identified this chamber as a chapel. Fritsch (2018, pp. 289–90) suggests that this chamber served as a pastophorion,[25] while the delimited section at the church's center, which is the architectural focal point of the church towards which the clergy was oriented while seated, served as the sanctuary and contained the altar. Thus, this church would have contained a central, square sanctuary, a main element of the later concentric Ethiopian churches.[26]

As pointed out by Fritsch (2018, p. 292), there is a chronological gap between the thirteenth-century destruction of the Cruciform Church at Dongola and the late fifteenth/sixteenth-century appearance of concentric circular churches in Ethiopia. A church that has been seen as a possible forerunner of concentric churches in Ethiopia is the church of Betä Giyorgis (St. George, Figure 4) in the church compound of Lalibäla, which may have been inspired by Nubian precedents (Fritsch 2008, pp. 105–6; 2018, pp. 287–88). This church is cruciform, and hence has a centralized structure, though the sanctuary is located in its eastern arm rather than its center.[27] This church certainly represents an important step in the direction of concentric church architecture, but many of the features of the later concentric circular church are not yet reflected in it.

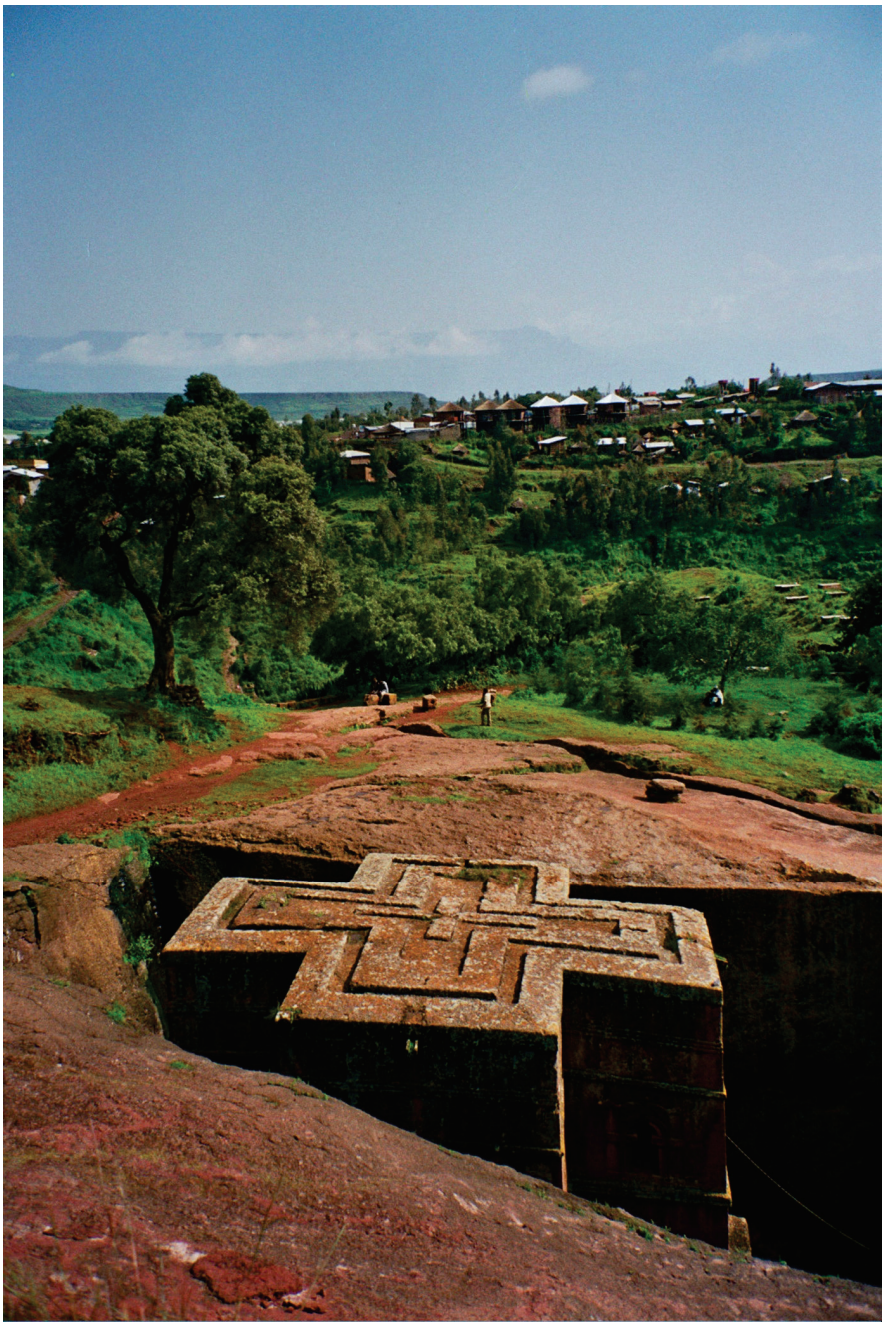

Figure 4. The church of Betä Giyorgis at Lalibäla.

2.5. Emulation of the Church of the Holy Sepulchre

The Church of the Holy Sepulchre has been, for Ethiopian Christians, a source of inspiration and a revered pilgrimage destination, as it has been for Christians throughout the world. The most important focal point of this church is the Tomb of Jesus, located at the center of a concentric structure (Figure 5), the Anastasis (rotunda).[28] It has been suggested in the scholarship that the concentric circular Ethiopian church plan was modeled after this layout (Fritsch 2018, pp. 282–86; Pérès 2006; di Salvo 1999, p. 73). I will argue below that while, in my opinion, the Ethiopian concentric circular church is not based directly on the rotunda's layout, it is inspired by the same architectural concept that served as a prototype for the latter.

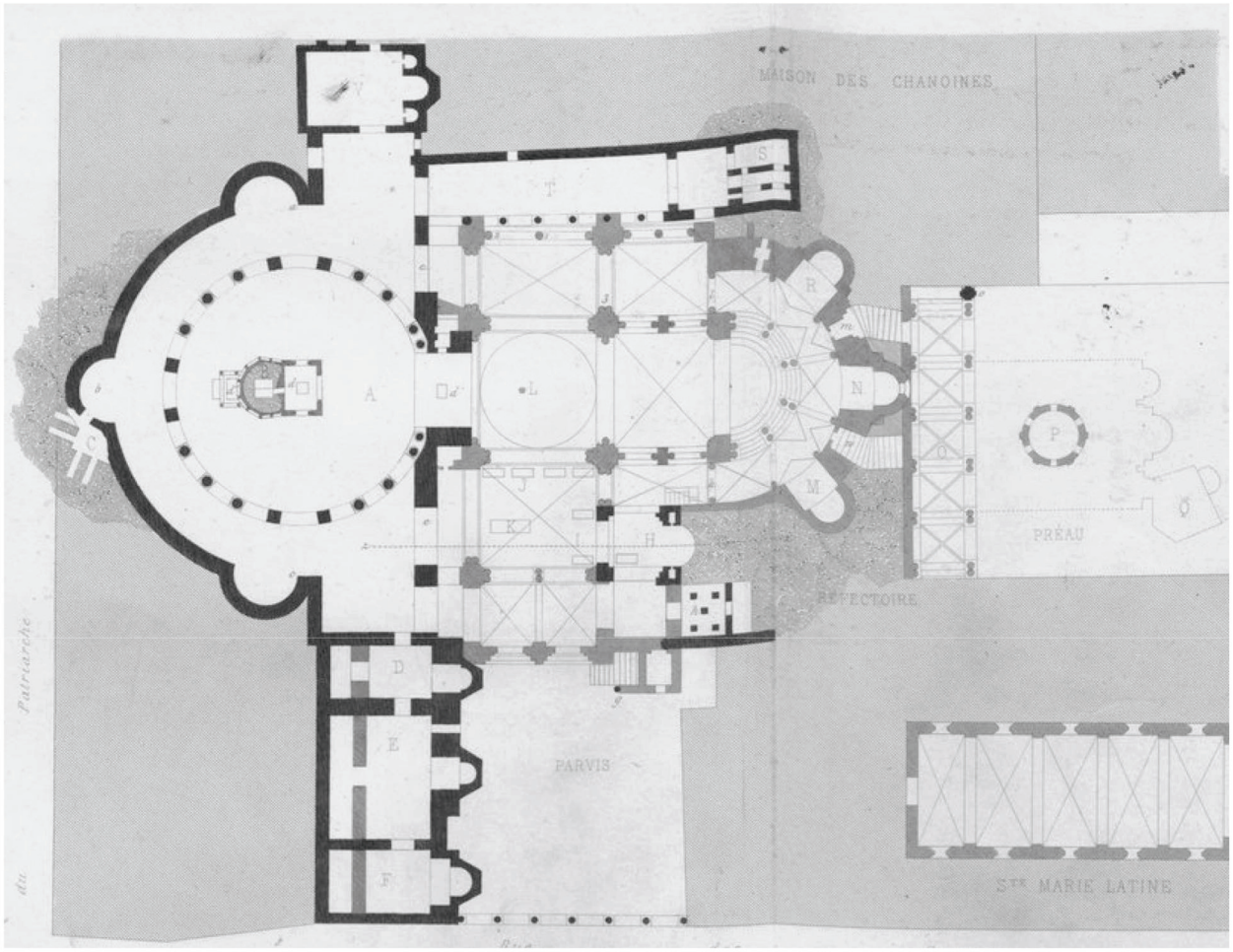

Figure 5. Plan of the Church of the Holy Sepulchre, with the Anastasis at the western end, as published by de Vogüé in 1859. In the center of the Anastasis is the aedicule, the chapel built over the tomb of Jesus (de Vogüé 1859, Plate 8. Source: gallica.bnf.fr).

2.6. Emulation of the Jerusalem Temple

A source of inspiration frequently mentioned in the literature dealing with Ethiopian churches is the Jerusalem Temple.[29] In the past, it was widely accepted in scholarship that the affinity of Ethiopian churches with the Temple was expressed through the former's tri-part division into an interior sanctuary surrounded by two concentric ambulatories. This division accords, to an extent, with a conceptual division of the church into three sections: a *mäqdäs*, or sanctuary (the term can refer to a temple, sanctuary, or holy place); a *qəddəst*, the space outside the sanctuary's entrance where various aspects of the liturgy are performed and where the laity receives communion (literally 'the Holy');[30] and a *qəne*

maḫlet, beyond the *qəddəst*, where church music is performed and to which the laity has regular access.[31]

Such a tri-part division accords with the tri-part division of the Jerusalem Temple, and the terminology used has striking parallels to that used in the Temple—*mäqdäs* is equivalent to the Hebrew *beit ha-miqdaš*, i.e., Temple (in Gəʿəz, *betä mäqdäs*) and *qəddəst* to the Hebrew *qodeš*, i.e., Holy, the space adjacent to the Holy of Holies.[32] As elaborated elsewhere, the terminology used by the Betä Ǝsraʾel in their concentric circular synagogues is an even closer match to the terminology used with regard to the Jerusalem Temple (Kribus 2023).

The layout of both the First and the Second Jerusalem Temple was, however, considerably different from that of the concentric circular prayer house. The Temple was roughly quadrangular, and its different sections were not concentric but arranged on an east–west axis. Its sanctuary, the Holy of Holies, was at its western end (Patrich 2011; Shapira 2018). Fritsch (2018, pp. 279–82) argues that while a tri-part division of space, an element common to Ethiopian churches, both concentric and non-concentric, can be considered affiliated with the Jerusalem Temple, it is not clear why the concentric plan itself would be considered affiliated with it. This raises the following question: was the concentric circular plan designed to emulate the Temple? And, if so, how did the concentric circular layout come to be identified with that of the Temple? An answer to this question may be found in the Late Antique and Medieval Holy Land, where the concept of the Jerusalem Temple as a concentric structure gradually developed.

3. Concentric Churches in the Late Antique Holy Land

While the basilica plan served as the main prototype for church architecture in the Late Antique Byzantine realm, not all churches in this realm were basilical. One type of church, of significance to the topic at hand, is the concentric (circular or octagonal) church.[33] Scholarship has pointed to the inspiration for this type deriving from concentric *mausolea* structures (burial monuments) in the Roman World, and possibly from concentric structures in additional forms of Roman monumental architecture, such as palace complexes (Patrich 2006a, p. 365; Ward-Perkins 1966). Concentric churches were often built around and in commemoration of a sacred focal point. They thus differed from basilical and basilica-derived churches in that the conceptual and architectural focal point of the church was not a sanctuary at the eastern end but rather the sacred object or place at their center. Some concentric churches featured an apse and bema at their eastern end, thus providing a focal point for liturgy towards the east, comparable to that of basilica churches and differing from and co-existing with the sacred focal point at their center (Patrich 2006a, pp. 365–67).

Such churches are frequently referred to in scholarship as *martyria* (martyries), a term that commonly refers to churches built to commemorate the burial place or remains of martyrs, though it can also be used more broadly to refer to churches commemorating occurrences of theophany (Avner 2010, p. 32; Ward-Perkins 1966). The Holy Land abounds with holy sites not necessarily connected with burial, and hence several of its concentric churches commemorate these sites rather than martyr remains.[34]

Two fourth-century examples of commemorative concentric structures are incorporated into basilical church complexes: the above-mentioned *rotunda* surrounding the tomb of Jesus, part of the complex of the Church of the Holy Sepulchre, and the octagon, which marked the site of the Nativity in the Church of the Nativity in Bethlehem (Patrich 2006a, pp. 364–65). Late Antique concentric churches in the Holy Land not associated with basilica structures include the Church of the Ascension on the Mount of Olives (fourth century, Corbo 1965, pp. 97–114); a round church in Beth She'an (fifth/sixth century, Arav 1989); the octagonal church built over St. Peter's house in Capernaum (fifth century, Talgam and Arubas 2015); the Church of Mary Theotokos (Figure 6) on Mt. Gerizim (fifth century, Magen 1990); a church in Caesarea (fifth century, Shalev-Hurvitz 2015, pp. 235–51); and the Kathisma Church (Figure 7) on the road connecting Jerusalem and Bethlehem (fifth century, Avner 2010). Thus, the concept of a concentric circular or octagonal church containing and commemorating a holy site was well-established in the Holy Land at the time of its Islamic

conquest in 638. But, the link between this type of structure and the Jerusalem Temple had not yet been established.

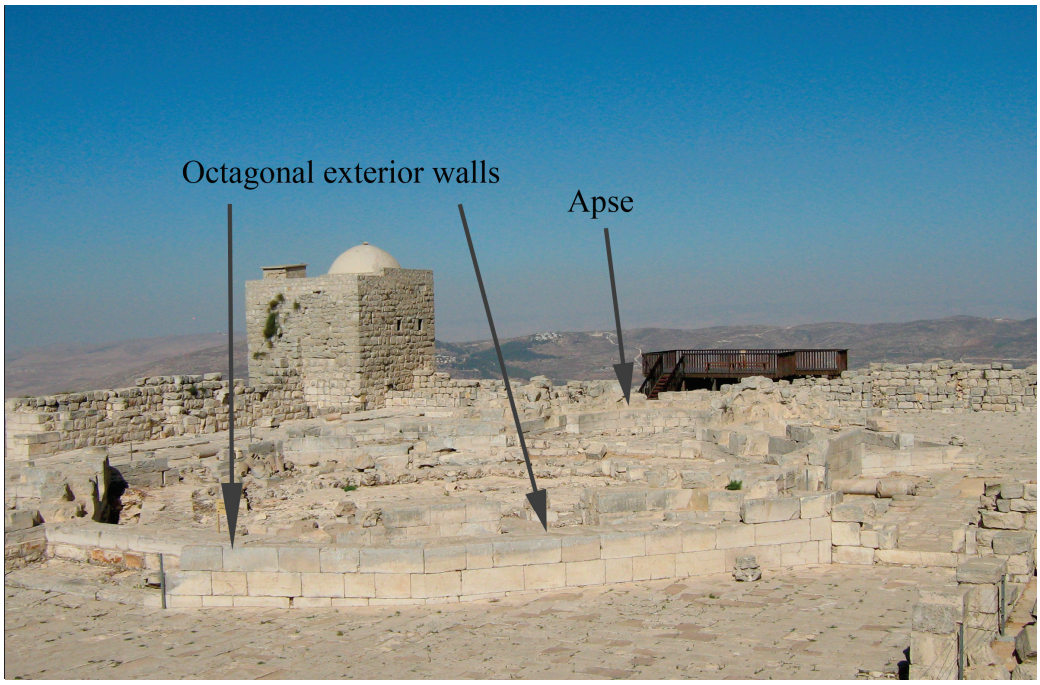

Figure 6. Remains of the Church of Mary Theotokos, Mt. Gerizim.

Figure 7. Remains of the Kathisma Church, Jerusalem. Notice the walls delimiting the octagonal prayer hall.

4. From Bayt al-Maqdis to Templum Domini

Hand in hand with the gradual development of a unique Islamic architectural and artistic tradition, the early years of Islamic rule in the Holy Land saw a substantial degree of continuity of the Byzantine architectural and artistic traditions that had preceded it in the region. Local architects and workers were employed by Islamic authorities, and built upon themes they were familiar with, adapting them to express Islamic concepts. A striking example of this is the construction of a remarkable structure of central importance in Islamic theology and history—the Dome of the Rock in Jerusalem (built circa 691–92, Figure 8).

Figure 8. The Dome of the Rock, Jerusalem.

The reasons for the construction of the Dome of the Rock and the multiple messages it was designed to convey have been examined extensively in scholarship and we will, therefore, not repeat all of them here.[35] One aspect of the religious symbolism of the Dome of the Rock, and indeed of the entire esplanade on which it was built,[36] was its engagement with the esplanade's and the Rock's past Israelite heritage. Monotheistic faith in the years prior to the rise of Islam and the legacy of the biblical prophets are considered part of the heritage of the Islamic religion, and the Dome of the Rock expressed this architecturally and conceptually. The rock as the former site of Solomon's Temple is a recurring theme in Early Islamic tradition (Hillenbrand 2018, pp. 129–32; Kaplony 2009, pp. 105–18), and indeed, the name chosen for the esplanade in the Early Islamic period was Bayt al-Maqdis, literally "the Temple" (compare with the Hebrew *beit ha-miqdaš*), and al-Bayt al-Muqaddas, literally "the Holy House". In this way, the Early Islamic Umayyad dynasty, under whose auspices the esplanade was renovated and the Dome of the Rock and the al-Aqṣā mosque built, honored the legacy of the biblical prophets and demonstrated a continuity with it.

As a monument built to honor and commemorate the rock that embodied the biblical heritage of the esplanade, the plan chosen for the Dome of the Rock (Figure 9) was that of a concentric octagonal prayer house. This plan, as we have seen, was the one commonly utilized in the region at the time for structures built above and commemorating a holy place.

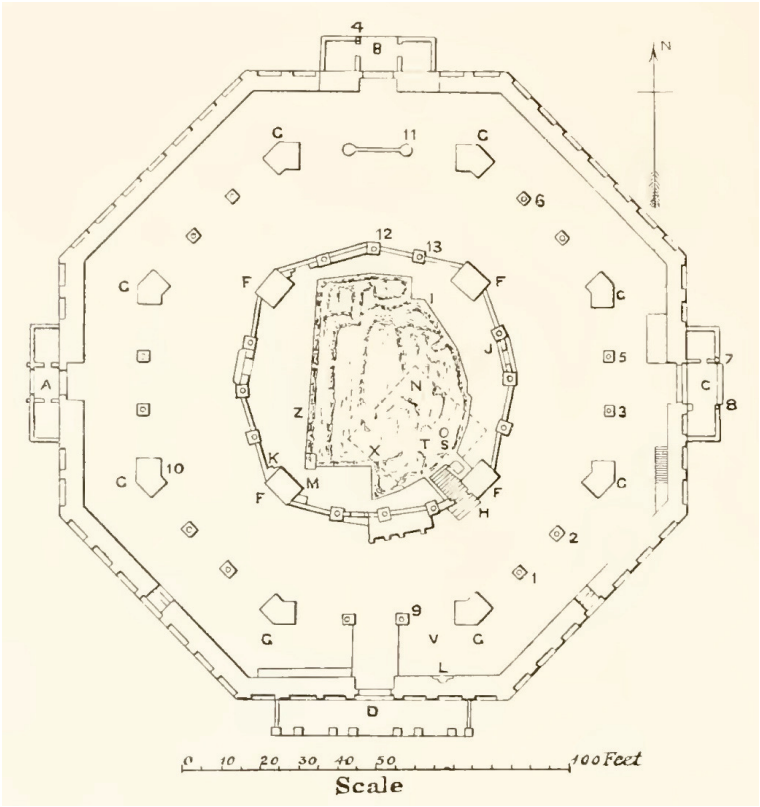

Figure 9. Plan of the Dome of the Rock (Clermont-Ganneau 1899, p. 154).

Affinity between the Dome of the Rock and the heritage of Solomon's Temple was not only expressed within the Islamic tradition but rather in all three major Abrahamic religions. For Jews, the Islamic conquest of Jerusalem was a source of messianic hopes. Prior to the Islamic conquest, when the Holy Land was under Christian Byzantine rule, the ruins of the Jerusalem Temple and Temple Mount played a significant role in Christian anti-Jewish polemic. They stood in stark contrast to the numerous monumental Christian churches that dominated the Jerusalem landscape, thus symbolizing the passage of divine favor from Judaism to Christianity. The subordinate status of the Jews was also exemplified by the prohibition of Jews from residing in Jerusalem and the limitations placed on their worship there.[37]

The early years of Islamic rule in the Holy Land saw a dramatic change in the status of Jews vis-à-vis the Holy City and in the status of the holy site, which was the focal point of Jewish yearning and prayer. Islamic authorities enabled the Jews to return to Jerusalem and establish a neighborhood there. Accounts of the initial uncovering of the Rock relate that the Jews aided the Muslims in locating and uncovering it (Gil 1987). Initially, Jews were allowed to serve in the maintenance of the esplanade, though this right was later reserved solely for Muslims (Gil 1987, pp. 136–38; Kaplony 2009, pp. 109–12).

Various accounts written by Christians during the Early Islamic period identify the Dome of the Rock with Solomon's Temple (Berger 2012, pp. 55–73; Griffith-Jones 2018, p. 313). It has been suggested that aspects of the architecture of the late eighth-century Palatine Chapel in Aachen, built by Charlemagne, were inspired by the layout of the Dome of the Rock, utilized to demonstrate affinity with Solomon's Temple and with Jerusalem more broadly. Such elements include an octagonal layout (which, in the Palatine Chapel, features in the interior), above which is a drum pierced by windows and roofed by a dome (Berger 2012, pp. 56–57; Griffith-Jones 2018, pp. 306–19; Kühnel 1995). Thus, Christian architectural expressions of the concept of the Dome of the Rock as the Temple seem to have preceded the Crusades.

Following the Crusader conquest of Jerusalem in 1099, the Dome of the Rock was converted into a church by the name of Templum Domini, literally "the Temple of the Lord", which commemorated and was seen as embodying the Jerusalem Temple (Hillenbrand 2018, pp. 138–39). The Templum Domini became one of the two major Christian religious focal points in the city, the other being the Church of the Holy Sepulchre. The adjacent al-Aqṣā mosque was referred to as the Templum Solomonis or Palatium Solomonis, "Temple of Solomon" and "Palace of Solomon" respectively, and served first as the residence of the king of the Crusader Kingdom of Jerusalem, and later as the headquarters of the Knights Templar (Kedar and Pringle 2009).

The concept of the Dome of the Rock as the Temple was not only a matter of terminology—it was reflected in Christian, Jewish, and Islamic art—the Temple was depicted in the form of the Dome of the Rock in various paintings and illuminations from the eighth century onwards (Berger 2012; Krinsky 1970). Thus, the Dome of the Rock was seen not only as commemorating but also as embodying the Jerusalem Temple.[38]

5. The Concentric Circular Plan as an Expression of Affinity with the Jerusalem Temple

We return now to the question of why the plan of concentric circular Ethiopian churches would be an expression of affinity with the Temple. Given the widespread concept of affinity between concentric structures and the Temple described above, the answer seems clear. The Solomonic Kingdom maintained diplomatic correspondence and commercial ties with both Christian Europe and the Islamic World (Kelly 2020; Krebs 2021; Wion 2020), as well as a monastic presence in Jerusalem. Pilgrimage from Ethiopia to the Holy Land is a well-known phenomenon in the Middle Ages and Early Modern times (Cerulli 1943; Pedersen 2007). Thus, architectural and artistic concepts prevalent in the West and Middle East, as well as the general characteristics of religious structures in Jerusalem, would not have been unknown in Early Modern Ethiopia.

Without contradicting the suggestions for the emergence of the concentric circular Ethiopian prayer house plan put forward in past scholarship (many of which provide a sound and likely explanation for this phenomenon), I would like to suggest the following: A factor in the adoption of the concentric circular prayer house plan was the prevalent concept that this type of plan indeed embodies the Jerusalem Temple. Granted, the plans of the Dome of the Rock and the concentric memorial churches that preceded it are not direct parallels to that of the Ethiopian concentric circular and octagonal prayer house. But, there is a striking similarity in the general concept—a concentric structure with a religious focal point in the center. In the case of the Dome and of Ethiopian concentric prayer houses (both churches and synagogues), the religious focal point is conceptually, in a way, the same:

The Ethiopian church sanctuary symbolizes the Holy of Holies of the Temple, and accordingly contains the *tabot*, which symbolizes the Tablets of the Law and the Ark of the Covenant. The Ethiopian synagogue sanctuary is referred to as *qəddusä qəddusan* or *qəddəstä qəddusan*, literally "Holy of Holies" (Flad 1869, 42–44; Leslau 1951, xxii) and contains, among other liturgical items, the *Orit*,[39] which, like the Ark of the Covenant, symbolizes the Covenant between God and the Israelites. The Dome of the Rock contains the Rock, which is considered the site of the actual Holy of Holies of the Jerusalem Temple.

For the Solomonic dynasty, which derived its legitimacy, in part, from the tradition of its descent from the biblical King Solomon and Queen of Sheba (HaCohen 2009), designing a church according to a plan that embodied the temple built by this king would have been a powerful image, a visual manifestation of continuity with the biblical monarchy.[40] This would perhaps explain why such a bold innovation, to use Heldman's term, was carried out. Such an innovation would have accorded well with theological concepts prevalent in Ethiopian Orthodox Christianity:

Ethiopian Orthodox Christians see themselves as Israelites and descendants of biblical Israelites—the entourage that, according to the narrative of the *Kəbrä Nägäśt*, considered the national epic of Christian Ethiopia, accompanied the son of King Solomon and the

Queen of Sheba from Jerusalem to Ethiopia.[41] The Old Testament is held in high regard by Christian Ethiopian society, and many of its commandments, rejected by other streams of Christianity, are considered binding.[42] Thus, it is conceivable that an emulation of the Temple in prayer house architecture would have been seen in Solomonic society as an expression of its affinity with its biblical roots.

As I have demonstrated elsewhere, the Betä Ǝsraʾel, basing themselves on the concentric circular plan, designed their synagogues to emulate the Jerusalem Temple to a greater degree than that of Ethiopian Churches. The terminology of the different sections followed that of the Temple more literally. An altar was built in the synagogue precinct, where sacrifices were offered in accordance with biblical decree. The main entrance to the synagogue and sanctuary were from the east westwards, possibly in emulation of the direction of entrance into the Temple (Kribus 2023). While the chronology of the development of Betä Ǝsraʾel synagogue architecture is not yet known, such a literal emulation of the Temple seems a likely indication that the concentric circular plan was indeed perceived in Ethiopia as being affiliated with it.

6. Conclusions

Just as texts tended to travel from region to region, be translated into different languages, and evolve as they crossed from one cultural or religious realm to another, so too did architecture. Religious architecture is a powerful and expressive medium, which, together with the messages it conveyed, frequently traversed cultural and religious boundaries. All three major Abrahamic religions have roots in the Old Testament, and hence, the concept of the Temple as a central, and in the case of Judaism, the central, religious site resonated with them. This created common ground that facilitated an interplay of architectural and symbolic concepts embodying the Temple. Architectural expressions of affinity with the Temple conveyed affinity with the biblical heritage, with God's divine promise.

The concept of the Jerusalem Temple as a concentric structure is one that all three major Abrahamic faiths contributed to and that developed and acquired new meanings and variants as it crossed from one realm to another. The Israelite/Jewish concept of the Jerusalem Temple as the religious center, and of the rock as the location of the Holy of Holies, the focal point of this center, coupled with the architecture of Byzantine churches commemorating holy sites, served as the basis for the layout of the Islamic Dome of the Rock, commemorating the biblical Bayt al-Maqdis. This commemoration was understood by members of all three Abrahamic faiths, who came to see the Dome as the embodiment of the Temple and depicted the Temple in its form. Accordingly, churches (and in Ethiopia, also synagogues) that were conceptually modeled after the temple were designed with a concentric circular or octagonal layout, and in Ethiopia, also with a central, square sanctuary, possibly, as suggested by Heldman, modeled after the form of the Holy of Holies as described in biblical accounts. These prayer houses served their patrons and communities to express affinity with the Temple, and by extension, with Jerusalem and the Israelite biblical heritage.

To end with a poetic note, the existence of Jewish, Christian, and Muslim prayer houses all modeled after the same general architectural concept to embody the Temple can be seen as a realization of the biblical verse "for my house shall be called a house of prayer for all peoples" (Isaiah 56:7). The history of dynamics between the Abrahamic faiths with regards to the Temple and its Mount is not only one of competition. It is also one of shared inspiration, expressed in architecture and art, honoring common biblical roots.

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Notes

1 For an overview on this kingdom's history and material culture, see (Finneran 2007, pp. 146–206; Phillipson 2012).

2 While Aksumite churches were designed in accordance with the widespread basilica plan, they do exhibit some unique features—the construction techniques and some of the decorative motifs employed in them reflect the building tradition of Aksumite elite residences (a tradition pre-dating the arrival of Christianity) and decorative schemes of Aksumite funerary and cultic monuments (Muehlbauer 2023, pp. 27–42; Phillipson 2009).

3 For an overview of early medieval Ethiopian church architecture, see Lepage and Mercier (2005); Muehlbauer (2023); Phillipson (2009). For a discussion on the development of Ethiopian Church architecture from Late Antiquity to the present, see Heldman (2003); di Salvo (1999, pp. 57–95).

4 The eastwards orientation was retained, to an extent, by the placement of the primary entrances of both the church and the sanctuary in the west (Heldman 2003, p. 738).

5 For an overview on this ecclesiastical center, see Finneran (2007, pp. 224–36); Fritsch (2008); Phillipson (2012, pp. 227–43).

6 For examples of such studies, see Bosc-Tiessé (2008); McEwan (2013).

7 In a previous study, I have endeavoured to demonstrate the potential of a comparative approach taking into account more than one religious tradition by comparing the architecture and associated terminology of Betä Ǝsraʾel (Ethiopian Jewish) and Ethiopian Orthodox concentric prayer houses, with very encouraging results (Kribus 2022, 2023).

8 Since most churches identified as early concentric circular churches are active ecclesiastical foundations, archaeological activities in their compounds are not permitted.

9 For an overview and analysis of such mentions, see Fritsch (2018, pp. 272–73). For examples of structures with a quadrangular layout identified as churches and dated to the Early Solomonic period, see (Chojnacki 1969; Fritsch and Derat 2012; Ricci 1976).

For examples of specific circular churches, either undated or dated from the sixteenth century onwards, see (di Salvo 1999; de Contenson 1961, pp. 43–44).

10 For an overview of this conquest, see Muth (2003).

11 (Béguinot 1901, p. 25). The name of the stronghold appearing in the chronicle is Gəše, but its identification there as the kings' stronghold accords with Amba Gəšän's role at the time (Haile Gabriel Dagne 2003). This, together with the similarity of the names, indicates that the stronghold in question is Amba Gəšän.The chronicle belongs to a literary genre known as the Tarikä Nägäśt, i.e., the History of Kings, and referred to in scholarship as the "Short Chronicles". The narration in the chronicle ends with the death of the Solomonic monarch Bäkaffa in 1730. This event thus serves as a *terminus post quem* for its final compilation.

12 (di Salvo 1999, pp. 73–76; Phillipson 2009, p. 27). The term quadrangular, rather than square or rectangular, is used here to account for both square and rectangular structures and chambers.

13 The west-east orientation is a feature common to all sanctuaries of Ethiopian concentric churches, including those that are square in shape. In square examples, it is expressed through the location of the entrances into the sanctuary in its western side, and of the altar within it in its eastern side.

14 (Phillipson 2012, pp. 24–29, 130–31). The hypothesis that the initial conversion of the temple structure to a church took place in Late Antiquity is based on the discovery of a baptistery within its sanctuary. Similar baptisteries were discovered in other Ethiopian churches, some securely dated to the Aksumite period (Phillipson 2009, pp. 37, 45–47, 90–91).

15 In principle, the circular or octoganal exterior and the ambulatory in the interior of the church could also facilitate circumambulation. To the best of my knowledge, circumambulation of the church structure is not practiced frequently in Ethiopian Orthodox liturgy (for an overview on this liturgy, see Binns 2017, pp. 87–98; Chaillot 2002, pp. 101–27; Ephraim Isaac 2013, pp. 85–90). Some annual religious processions, such as that on Palm Sunday (*Hośaʿəna*), do encircle the church (Chaillot 2002, pp. 118–19; Kaplan 2005, p. 511), but this can also take place around quadrangular churches, and is thus not substantially impacted by the church's layout. For examples of circumambulation and associated symbolic meanings in European and Mediterranean Christianity, see (Miller 1986, pp. 516–19; Panofsky 1946, p. 115).

16 Fritsch (2018, pp. 268–70) remarks on this shift from affording the congregation direct view of the liturgy to obscuring the view, and points out that some of the features obscuring the view, such as a screen before the altar, have Coptic precedents. Hence, the overall tendency to obscure the view of the liturgy may have been substantially impacted by trends in Coptic Christianity. For an examination of developments in Ethiopian liturgy and church architecture linked with parallel developments in the Coptic Church, see Fritsch and Gervers (2007). Among such developments addressed in their study are changes in the usage and form of the space flanking the church sanctuary: Initially, *pastophoria* chambers flanked the sanctury, and within them, the Eucharistic bread and wine was prepared prior to being carried to the altar. Later, the Eucharist was prepared on the altar, thus enabling the spaces flanking the sanctuary to be used for other purposes. In some cases, altars (some of them portable) were installed in the flanking spaces, and the mass could be celebrated there. A further development is the disappearance of side rooms flanking the sanctuary (presumably since these were no longer deemed necessary). Multiple altars were in some cases placed in the sanctuary, following a Coptic tradition that enabled mass to be celebrated several times, on different altars, in a single church. See also (Muehlbauer 2023, pp. 53–56). It should be noted that developments in the layout and usage of the spaces flanking the sanctury due to liturgical changes were not limited to the churches of Egypt and Ethiopia. For a similar phenomenon in the Late Antique Holy Land, see (Patrich 2006b). For additional examples of links between Egypt and the Ethiopian Highlands and their impact on church architecture in Ethiopia, see (Muehlbauer 2023, pp. 135–63).

17 For an overview on domestic architecture in the north-western Ethiopian Highlands, see (Aspen 2007). In the north-eastern Ethiopian Highlands, a common type of dwelling known as *həḍmo* is quadrangular rather than circular, though circular dwellings are also utilized (Volker-Saad 2007).

18 (Fritsch 2018, pp. 275, 286–87; di Salvo 1999, pp. 76–77). Afework Hailu (2020, pp. 240–45) discusses the possibility that an impact of local building traditions on church architecture was a result of Christian expansion into formerly non-Christian regions. The inhabitants of such regions constructed circular dwellings and public structures, some of which were of a religious nature.

19 Sisay Sahile, personal communication. See also (Fritsch 2018, pp. 279–80).

20 Finneran (2007, p. 257) raises the possibility that a concept of the cosmos as arranged in a concentric circular manner and the concentric layout of churches and of the royal camp may be affiliated to each other. For indications of such a cosmological concept in manuscript illuminations, in some of which the Christian Ethiopian holy city of Aksum features as the central focal point, see (Pankhurst 1989).

21 (Fritsch 2018, pp. 276–77). In a text committed to writing in 1929 (Griaule Ms. 52), belonging to a genre known as *Śərʿatä Betä Krəstiyan* (see below), it is written, regarding the Ethiopian Church: "The church [structure] is likened to the world. When the priest offers incense, he circles the church three times" (Griaule 1932, pp. 24, 30, translated from Amharic by the present author).

22 A *tabot* is the altar-tablet upon which the Eucharist is held in Ethiopian Orthodox churches. It is consecrated, and bears a dedication which commonly gives its name to the church in which it is kept. The tabot is considered the most sanctified object in a church, an object which bestows its sanctity upon the church (Heldman 2011).

[23] Fritsch (2018, p. 287) suggests that liturgical considerations favoured the square sanctuary—that this shape was fitting for liturgical elements affiliated with Coptic norms and present in Ethiopia, such as a lockable door and a marking on the east. He adds that the square layout could be based on that of the quadrangular sanctuaries of earlier Ethiopian churches.

[24] For an overview on this church and on centralizing tendencies in Nubian church architecture, see (Gartkiewicz 1972). For an overview on Makurian church architecture, see Godlewski (2019). For a general examination of Nubian church architecture, see (Finneran 2002, pp. 92–119).

[25] For an overview on this liturgical element and its evolution over time, see (Fritsch and Gervers 2007; Patrich 2006a, pp. 387–92; 2006b).

[26] Cultural contacts between Nubia and Ethiopia are indeed attested in the Middle Ages, and, as Fritsch (2018, pp. 290–92) demonstrates, some elements of ecclesiastical architecture of Nubian provenance have been utilized in medieval Ethiopia.

[27] This church has been dated to the thirteenth century (Fritsch 2018, pp. 287–88; Muehlbauer 2023, pp. 198–99; Phillipson 2012, pp. 229–37), though some scholars suggest a later date, in any event prior to the sixteenth century (Fritsch and Gervers 2007, pp. 33–34).

[28] For an overview on this structure and on the architecture of the Church of the Holy Sepulchre more broadly, see (Patrich 1999; Pringle 2018).

[29] See, for example, (Pérès 2006, pp. 160–63; Ullendorff 1968, pp. 87–89).

[30] Fritsch (2018, p. 282) argues that the term *qəddəst* refers to the *presbyterium*, an area which in Ethiopian basilica-derived churches was, up until the twelfth century if not later, delimited by a chancel screen.

[31] *Qəne* is a type of liturgical poetry (see Habtemichael 2011). *Maḫlet* is a type of hymn (see Ezra Gebremedhin 2007).

[32] The affiliation of the church structure with the Jerusalem Temple is further stressed in a text belonging to the Ethiopian literary genre by the name of *Śərʿatä Betä Krəstiyan*, i.e., Order of the Church. Such texts contain allegorical descriptions of the church structure, which, it has been suggested, refer to concentric Ethiopian churches. The initial appearance of these texts has been dated to the eighteenth century (Nosnitsin 2011), though it has been suggested that some of their motifs have roots in earlier ecclesiastical literature (Fritsch 2018, pp. 276–77). The text in question, committed to writing in 1929 (Griaule Ms. 52), states that two poles should be erected in the church, symbolic of the two colums Yaq^{w}m and Bäläz (Jachin and Boaz, see 1 Kings 7:15–22), erected by King Solomon in the Jerusalem Temple (Griaule 1932, pp. 23, 29).

[33] An additional church type with concentric qualities and roots in Late Antiquity is the cruciform church (Patrich 2006a, pp. 368–69). Since this church type is not as direct a parallel to the concentric circular Ethiopian church, it will not be discussed here in detail.

[34] (Patrich 2006a, pp. 366–67). For a detailed examination of the concentric Byzantine-period churches of the Holy Land, see (Shalev-Hurvitz 2015).

[35] For an in-depth examination of this issue and references to additional relevant studies, see (Avner 2010; Rosen-Ayalon 1989; Cytryn 2020).

[36] This esplanade is known in the Jewish and Christian tradition as the Temple Mount, in reference to it being the site in which the Jerusalem Temple had stood. In the Early Islamic tradition it was known as Bayt al-Maqdis and later as al-Ḥaram al-Sharīf (the Noble Sanctuary).

[37] There is extensive literature on this topic. See, for example, (Safrai 1999; Tsafrir 2009).

[38] Gervers (2018) calls attention to round churches built in England during the twelfth and thirteenth century, many of them by military orders that developed in the Holy Land (the Templars and Hospitallers). The round layout of these churches has been interpreted in scholarship as alluding to the *rotunda* of the Church of the Holy Sepulchre, and the churches were seen as affiliated with Jerusalem. It seems likely, given the familiarity of these orders with Jerusalem, and the conceptual link between the Templars and the Temple and Temple Mount, that an element of the symbolism of at least some of these churches could be affinity with the concentric layout of the Dome of the Rock as a symbol of the Jerusalem Temple.

[39] The *Orit*, commonly paralleled with the Hebrew *Torah* (Pentateuch), is a Geʿez compilation of the Pentateuch and the books of Joshua, Judges, and Ruth (Kaplan 2003, p. 558; Pietruschka 2011).

[40] For a discussion on the emulation of the Temple and of King Solomon by the Solomonic monarchy in architecture and art, see (Krebs 2021, pp. 215–20).

[41] The *Kəbrä Nägäśt* is a literary work compiled in the fourteenth century based on earlier material. Its main narrative deals with the meeting between King Solomon and the Queen of Sheba in Jerusalem; the birth in Ethiopia of their son, Bäynä Ləḥkəm (popularly known as Mənilək); his journey to Jerusalem to meet his father; his return with the firstborn sons of the ministers and elders of the kingdom and with the Ark of the Covenant; and his establishment of the law of the Kingdom of Israel in Ethiopia, and through him, of the rule of the House of David there. The transference of the Ark of the Covenant to Ethiopia is portrayed as exemplifying the transference of God's grace from the People of Israel to the People of Ethiopia. Ethiopia would thus become, by virtue of God's favour and of the Ethiopians' partial descent from the Israelites accompanying Mənilək, a second Kingdom of Israel. For an overview on this work and its role in Christian Ethiopian society, see (HaCohen 2009; Marrassini 2007).

[42] (Isaac 2013, pp. 27–32; Pedersen 1999; Ullendorff 1968, pp. 73–115). There is ongoing debate in scholarship regarding the chronology and development of different Old-Testament-derived features of Ethiopian Orthodox Christianity (Kaplan 2021).

Nevertheless, many of these features, most notably concepts reflected in the *Kəbrä Nägäśt* narrative, would have been in place in the late fifteenth-early sixteenth century, when the concentric circular Ethiopian prayer house plan emerged.

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Article

Question and Symbol: Challenges for a Contemporary Bell Tower

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Abstract: Historically, bell towers have been religious and architectural symbols in the landscape that summoned the faithful to celebrations and fulfilled a crucial territorial significance task. This function was assumed by the towers of some universities. The real need of the University Francisco de Vitoria to build a bell tower for its new chapel and to be significant both for its campus and the city is the pretext to investigate the need for this element in the current context through an academic exercise with architecture students. Traditionally, the religious autority proposed a concrete celebration space. In this case, architecture students were commissioned to propose a contemporary response for the new bell tower of their university campus through a Design Workshop. The workshop result raises interesting questions about what the architecture of a bell tower should be like in the XXI century, the relationship with public space, the construction of a landmark on an urban scale, the need to respond to both the city and the immediate environment at its different scales, the obsolescence of elements such as clocks or bells, and, above all, the relevance of symbols and the way that architecture raises questions in the contemporary landscape.

Keywords: bell tower; university; symbol; project workshop; contemporary architecture

1. Introduction

Few architectural types have such a defined form as bell towers, whose original purpose was to raise the bells to a place where they could be heard and seen from afar. However, what began as a practical function of house bells was transcended to become an accurate social mechanism, becoming loaded with cultural and architectural symbolism (Gatty 1848; Gómez Martínez 1997). We know that people's way of relating to the world gives rise to diverse expressive and architectural forms, which originate precisely in the anthropological dimension of each epoch (Aymá González 2003). Its typological evolution has been reflected throughout history, not only in architectural trends but also in social and even spiritual ones, up to the present time. The decision of the Francisco de Vitoria University to build a bell tower on its university campus seems like the perfect pretext to review, from a contemporary perspective, the current relevance of this type of construction and its challenges: to make a stop along the way to reflect, from a genuine and concrete need, on the current relevance of an architectural type that has been so important throughout history. The reflection is not only theoretical but also practical and project-related. Although the building type "bell tower" requires a minimum historical and theoretical framework, the reflection is made from the project's practice through a university workshop with students of the UFV and future users of the building. Thus, from the concrete reality of the dialogue between the client and architect, it may be possible to outline some of the challenges facing bell towers today.

2. Origins and Mission: The Project Workshop—Reflections Through the Process of Projecting

In 2023, the Francisco de Vitoria University decided to tackle the construction of a new bell tower adjacent to its university temple, a recently constructed building. Although of apparent architectural interest, it is not identifiable as a church from the M-40, one of Madrid's ring roads, perhaps the point at which the University is most visible. The bell tower, however, aspires to transcend this mere necessity to endow the element with a much deeper meaning and, at the same time, to open a reflection, which crystallises in this work, on the relevance of bell towers in contemporary sacred architecture and their relationships with public space and the sense of belonging.

The Francisco de Vitoria University, through its leaders and when facing the project of the new bell tower, decided to entrust its future users, the students of architecture of the university, with a contemporary response to the proposed problem. As a university, it sought to generate new knowledge through architectural projects, understanding this to be the discipline's primary and original research method (Campo Baeza 2017; Ferrer 2009; Rivas 2009; Hernández Sampieri 2002). It was decided to carry it out through an Architectural Project Workshop in the form of a vertical workshop, involving all 2nd and 4th year students in mixed groups of five people over three weeks of intense work (Table A1, Appendix A), with intermediate juries in which the property always had a voice. In a final session, the university authorities attended the presentation of the different groups of projects. Among the projects presented, one was chosen for further development and adaptation. The location would be next to the University Church, and the maximum height allowed by the regulations is 25 m.

The main objective of the workshop, that is, of the project for the new bell tower, made explicit on the first day by the university authorities was the need to build a symbol: a reference to the city and to the interior of the campus itself, both to signify a religious building whose external appearance does not explicitly reveal its condition and to reaffirm an identity. The unavoidable references were the Church of Santa María de Caná by Fernando Higueras and that of San Pedro Mártir by Miguel Fisac, because they considered the property to have adequately responded to the problem of the construction of a religious and identity landmark next to the motorway, the same situation as the university, and because they were outstanding works by two undisputed masters of Spanish architecture with a great deal of influence on the School of Architecture.

The need to identify the new landmark as a religious symbol was stressed, but just as the university does not close its doors to non-believers, and in the context of open reason, the fundamental axis of the UFV, the new bell tower had to be an element that made "the invisible visible, that communicated a transcendence, that raised questions"[1]. In addition to its symbolic function towards the exterior, the university's rector emphasized the importance of building a space for congregation and a point of reference on campus.[2] The university itself, aware of the history of the "bell tower" element and of the historical moment we live in, raised the debate from the beginning: the commission itself is a manifesto of the challenges of a contemporary bell tower.

In its first sessions, the Workshop began with an important theoretical load, the visit to the churches of Fisac and Higueras, the contextualization of the type, understanding and analysis of the place, study and presentation of references and background to, and only from the second week, work on the project's architecture.

The study then contextualises the three challenges formulated by the university—the bell tower as a space for congregation, its symbolic function, and its relevance today—and the two proposed references with a situation similar to that of the University Church, to then analyse the results obtained in the workshop.

3. Context: Challenges for a Contemporary Bell Tower

3.1. Vertical and Horizontal Public Space: The Congregation

The first function of bell towers, and the origin of their birth, was to summon people to prayer; mark the time; and announce events, celebrations, and catastrophes; acting as social mechanisms of public communication and, therefore, builders in themselves of community (Aymá González 2007). The history of bell towers has been extensively studied, and numerous, very detailed studies on their origin and development refer to that historical development, although it is not the subject of this article (Price 1983; Frost 1995; Alcolea 1972; Gatty 1848).

In the Christian tradition, from the 9th century onwards, it became common to hang small bells from churches, attached by small wooden structures called 'turriculas', integrated into the churches (Arnold and Goodson 2012). Over time, bells became more prominent in the Middle Ages' soundscape, leading to a change in their structure (Ivorra Chorro 2002). The particular condition of bell towers and their original function, to amplify the sound so that it could reach as far as possible and to support the weight of the bells and their acoustic reverberation, meant that the typology of bell towers was a direct consequence of their acoustic and structural needs, as numerous studies show (Ansay and Zannin 2016; Alvarez-Morales and Martellotta 2015; Smith and Hunt 2008). In addition, this structural necessity gave rise to a very characteristic image in the landscape. Their robust and slender construction stood out against the urban or rural landscape, becoming an unavoidable visual and acoustic reference, a place for everyone (Corbin 1998; Frost 1995). In a way, the original bell towers were erected as a public space at a height, even if they were not habitable in themselves.

The bell towers defined a territory that they made habitable to the rhythm they set (Frost 1995; Alcolea 1972). They signalled a space that was not only physical but also symbolic, temporal, and hierarchical. The ringing of the bells marked the time of the community, and the ringing of prayers at dawn, midday, or dusk delimited the day. The tolling of the bells for the dead communicated sex, age, social status, or belonging to a neighbourhood or brotherhood (Llop i Bayo 2020). Processions, funerals, and the passage of a procession through a place were marked by special tolls that explained to the community that something important was happening in the shared space. They were even of great importance in preventing and announcing catastrophes and fires (Azanza López 1998; Baldan 2014). Thus, the language of bells built and reinforced a community, relating it simultaneously to a common constructed element: the bell tower (Alcolea 1972; Llop i Bayo 2020).

Eyes, ears, and people all responded to the call of the bell towers that promised a meeting place at their feet. Attached to the churches, the centre of city life in the Middle Ages, this vertical and virtual public space was always associated with a horizontal meeting space to accommodate a large number of people; the very architectural structure of the church brought together all the faithful in a space that often extended beyond the walls of the building to create squares and open areas that were quickly taken over for markets or different public events (Merzlyutina 2023). Thus, little by little, cities were configured from vertical landmarks that signalled horizontal public spaces. The bell tower stands as a sign of a place of congregation, of community: you know that at its foot, you are most likely to find people. They also encouraged encounters by establishing themselves as a reference point (Español 1999).

The architectural structure of the bell tower—the tallest, the most slender, the point of reference, the most incredible display of structural prowess—imposed on the average height of the city faithfully fulfils a role of absolute reference in people's lives. The actions of the inhabitants close to the bell towers changed according to what the bells marked: rarely

has an architectural element been so important, so decisive in people's lives (Corbin 1998; Ivorra Chorro 2002). It is therefore not surprising that this resulted in the identification of places with their bell towers, which became symbols of what united that community: a shared faith in a specific place that builds a particular identity (Feld and Brenneis 2004).

3.2. The Symbolic Function

The prominence of bell towers in urban and rural landscapes meant that, over time, these elements became beacons that transmitted the power of the church or municipality that built them and their presence in the life of the community in which they were built (Price 1983). Intricate designs and the aspiration to reach for the sky inspired fear and reverence, reflecting devotion or dominance and building a community identity. Their symbolic character became predominant, and little by little, the cities filled with towers, each one taller than the last, in a race for dominion of the sky that was, in reality, the aspiration of dominion on earth (Gómez Martínez 1997; Chueca Goitia 1947; Norberg-Schulz 1980). Not surprisingly, town halls, palaces, and universities adopted the tower as a symbolic element or as a sign of dominance, power, or distinction, giving rise to incredible landscapes, many of which have been destroyed due to their structural weaknesses. Power needed to be reflected in the heights (Price 1983).

The perversion of the domination of space finds a paradigmatic case in in Venice (Figure 1) San Gimignano, the Tuscan town famous for its 14 (which became 72) medieval towers, most of them built between the 12th and 14th centuries as a way of demonstrating the power and wealth of the families who erected them. The competition between the different noble families to build ever taller and more ornate towers resulted in a vertical urban landscape that was a symbol of status but also a defensive and surveillance system, becoming a focus of conflict (Giorgi and Matracchi 2019). It is interesting to see how, when the tower loses its function as a bell tower or symbol for the community and becomes a symbol of power, the architectural type of the tower goes from being a public place to a guardian of the private: it is to be seen for its defence and no longer has an associated public space beyond the courtyards of castles and palaces, although, in reality, it was nothing more than another way for people to congregate.

Figure 1. Friedrich Bernard Werner. *View of Venice*, which currently has more than 150 bell towers. Source: *Venetia. Le immagini della Repubblica*, 156, II/II; Cassini, 79. Nr.cat: Cod 7637. N° de ref. del artículo 11,574.

From the Middle Ages onwards, the bell towers and steeples of town halls and churches became focal points in people's lives, establishing spaces for congregation and centrality based on the dominance and power of the various ecclesiastical and civic authorities. Their ornamentation evolved, and the towers came to express the identity of the cities. The cross, which crowned the bell towers, became part of the structural design of the tower and a means of visual evangelisation in the Romanesque period (Focillon 1972), symbolic additions in the Gothic period that were intended to signify victory over evil (Bony 1983), or symbols of Christian domination in later centuries (Norberg-Schulz 1980). With its structural development and vertical aspiration, the Gothic style was the perfect trigger for the proliferation of these structures that changed the urban landscape forever (Price 1983).

"*You can tell what makes a society by knowing what its tallest building is*"[3], said the American anthropologist, historian, mythologist, writer, and university professor Joseph Campbell (Campbell 1988). If we follow this criterion, we can easily see through architecture what is most important, what structures each society, and how it changes over time. With the passage of time and the emergence of urban planning regulations, in many places, aware of these buildings' physical imprint and historical relevance, it became forbidden to build any structure higher than them so as not to eclipse their presence (Campbell 1988). Over time, government buildings and later skyscrapers belonging to large companies began to compete for that importance in the skyline of their cities (Sudjic 2011).

3.3. The Need for the Bell Tower and Its Problems Today

Today, the role of bell towers in contemporary culture is in crisis (Foulds 2016). Beyond their heritage value, the reality is that their primary function, calling people to prayer or ringing the bells, is in question. Many studies have explored the subject of the bell tower as a soundscape and its value (Suárez et al. 2015; Schafer 1994; Schwartz 1995; Llop i Bayo 2020), and, currently, with more vigour through bell ringer societies (such as Campaners or The Whiting Society of Ringers), but the reality is that in many places, there are already restrictions and even bans on their use (Parker and Spennemann 2020), including in the Town Hall of Pozuelo itself, where the university is located, and it has been shown that on numerous occasions they are a nuisance (Parker and Spennemann 2020; Brink et al. 2011). Sound is, therefore, not a reason for building a bell tower.

However, it can make sense today. Price argues that the transformation of bell towers today is a sign of resistance, serving as symbols of identity (Price 1983). The arrival of modernity meant a break with the traditional language of sacred architecture (Aymá González 2007)[4]. Tafuri (1968) argues that, due to stylistic fragmentation, architecture can no longer communicate universal values on its own. Different churches no longer resemble each other; their use and importance are not necessarily deduced from their formal appearance. Numerous studies have analysed the dynamics of sacred language in Spain (García-Asenjo Llana 2016; Fernández Cobián 2000; Fernández Cobián 2009; Delgado Orusco 2013; Delgado Orusco 1999). In this context, the need for a bell tower for the new Francisco de Vitoria University temple becomes clear. There are several reasons for this need. One of them, perhaps the most obvious and the trigger, is the result of one of the problems of sacred architecture since the 20th century: churches, since the liberation of styles resulting from the Modern Movement and the avant-garde, are no longer so easily identifiable as such, but often fall into the category of 'singular buildings' (García-Asenjo Llana 2016; Fernández Cobián 2000). This has endowed architecture with memorable places and constructions, many of them renouncing symbolic value in favour of a sensorial approach to architecture (Martínez-Medina 2013), but on the other hand, it has sometimes meant a certain disconnection with society, which sometimes needs symbols and familiar

places (Gómez Segade 1985). The role of bell towers has often been that of a bridge between society and contemporary architecture, and in the worst case scenario, a crutch that allows, like Venturi's 'I am a Monument' poster (1972) (Figure 2), churches to be recognised as such.

Figure 2. Drawing for "Recommendation for a Monument" from *Learning from Las Vegas* (Venturi et al. 1972).

Ignacio Vicens, one of the leading experts in contemporary sacred architecture in theory and practice, argues that today's society could do without symbols of the past that refer to unnecessary functions, such as bells, which are dispensable. However, they do have a function for the users because they make them connect with the tradition of their religiosity and help the faithful to appropriate a contemporary architecture not recognised in the collective memory (Vicens y Hualde 2012). Miguel Fisac expressed a similar view when he said that the bell tower in his churches was intended to emphasise the religious significance of the building (Delgado Orusco 2009), acting as a bridge between the past and the present (Price 1983).

The bell tower is, therefore, an element of religious visibility, with the enormous importance that this entails for the community of believers, often living in an urban invisibility that implies a loss of identity (Esteso and Martín-Andino 2022). Strategies for visibility, therefore, involve either the uniqueness of the architecture or, on many occasions, the height and significance of the bell tower of the churches (García-Asenjo Llana 2016; Vicens y Hualde 2009). Sacred architecture needs to raise its hand to get noticed among all the others (Campbell 1988), and that element that rises on the horizon to be seen by everyone at all times is used to show the founding origin of the institution.

The university intends to make the new temple the focal point of the campus, like the old universities, thus hearkening back to the historical origins of the building. It is clear, as mentioned above, that it makes no sense today to focus the debate on the relevance of bells and their historical function of communication and marking the passage of time in the internet age or to focus it on the competition for height, striking geometry, or large dimensions in the style of Campbell. However, it does seem necessary to recover the symbolic function of the bell tower in order to 'redefine the meaning' of a place, according to Aymá González (2007) or Vicens y Hualde (2009).

As a distinctive architectural element of the Christian church, the bell tower has a key symbolic significance. The church is a sacred space for the gathering/congregation of the community, and the bell tower is an element that signals this (Frost 1995). It distinguishes it from a homogeneous and standard environment. "*It implies identification with the place of special significance and the ability to radiate to the surrounding environment*" (Aymá González 2007). The presence of the bell tower refers to the 'founding of a place'. In a way, the architectural construction of the bell tower is equivalent to the construction of identity. It

is the symbol that gives a building visible identity and meaning. That is the starting point for rethinking the bell tower as a contemporary typology, and from that starting point, the University Francisco de Vitoria's commission to its students to design a new bell tower is approached.

3.4. Close References: From Fisac to Higueras

From the start of the commission, the university considered the unique position of the existing temple. The university's specific location, next to the M-40 motorway, links this project with two other highly relevant ones, as they were designed by masters very close to the university and with two locations very similar to that of the new UFV bell tower: two examples of 20th-century bell tower solutions next to the motorway, with the function of standing out over the territory, by two exceptional architects—Miguel Fisac and Fernando Higueras.

Introducing the car into our lives, replacing walking, has changed our ability to observe architectural detail as we move around. Jan Gehl, the renowned architect and urban planner, explains in his book, *Cities for People* (Gehl 2013), how the car's introduction has affected how we perceive and experience the city. According to Gehl, the speed at which we move in a car limits our ability to observe and enjoy the urban environment. When we travel by car, the experience becomes faster and more superficial, preventing us from appreciating the details and interactions that occur in urban life. This has once again led to a tall, simply-shaped building, such as a bell tower or a clock tower, becoming a first-rate iconic architectural element. The UFV knows that most people will identify the church and the university when they drive along the M-40. It aims to make its mark in the same way as the two leading examples proposed, which are in the same situation and are outstanding examples of architecture: the Theologate of San Pedro Mártir by Miguel Fisac and Santa María de Caná by Fernando Higueras.

The first is the bell tower of the Theologado de San Pedro Mártir complex of the Dominican Fathers, built by Miguel Fisac in 1955 (Figure 3). It is an architectural complex of rational architecture in brick and exposed concrete. It consists of a church—which presides over the complex—and a series of convent pavilions organized around a common garden as a cloister. It was built on an isolated plot on the city's outskirts, which has now become a busy access to Madrid from the north (A1 as a continuation of the M-30) and by the M-40 ring road, from where the bell tower stands out as a visual landmark.

The bell tower is a free-standing tower 51 m high "attached" to the rear façade of the church. With a square ground plan, 5.75 m on each side, it comprises 16 white reinforced concrete pillars, 50 $\times$ 50 cm in section, and a helical concrete ramp that links them and rises to the crown level. The tower is topped by a 12 m high sculptural element, a lattice of twisted steel tubes supporting a cross and two bells. The concrete Greek cross, 3.5 m on a side, houses two neon tubes on each side to illuminate it at night (Cabañas Galán 2014).

Fisac's bell tower is intended to be a sculptural landmark, a visible attraction from the road and, at the same time, from the inner cloister of the building (Delgado Orusco 2009). On the contrary, the bell tower goes completely unnoticed from the outside space surrounding the building. The tower's pillars touch the ground, but it is not accessible. It is fenced with a gate, and the interior ramp rises 4 m from the ground via a walkway that connects to the church's main building, from which it is accessed.

At the opposite end of Madrid, on the M-40 ring road, stands the bell tower of the church of Santa María de Caná by Fernando Higueras, built in 1999. Two 40 m towers joined at the top make up the monumental entrance portico to the church, which rises above the building and its surroundings, becoming a visual landmark (Crespo Díaz-Meco 2020).

The Higueras bell tower is part of the monumental façade of the building (Figure 4). It is an architectural element that solves several functions, as it not only houses the staircase and the bells but also builds the threshold and the entrance to the temple, and, especially, it is the presentation of the building to the city. The Higueras church is located at a crossroads of wide streets, generating ample urban space. The height of the bell tower facade of Higueras responds to the scale of the place; it has the function of "finishing" and presenting a singular building, building the front and the perspective of a square, with a clear intention of monumentality and visibility but also with the intention of recovering a certain traditional vision of the bell towers. "*Hopefully, the towers will be finished, and the storks will return to Pozuelo*", Higueras wrote in 1998 (Higueras 1998).

Figure 3. San Pedro Mártir from the highway. Photo by Luis Argüelles. Source: Fondo documental DOCOMOMO Ibérico.

Figure 4. Santa María de Caná, by Fernando Higueras. Photo: Håkan Svensson from Wikimedia Commons.

While Fisac's tower is a symbol of a religious building of rational aesthetics, a continuous visual claim from inside the building and from afar, Higueras's bell tower, above all, builds a public and monumental space. Both projects are outstanding visual references, especially from the M-40 that connects them, and dialogue with the small and the large scales at the same time.

4. Discussion of the Workshop Results

An analysis of the results of the workshop, the fruit of an enormous collective effort of listening, work, planning, thought, and dialogue, can help to shed light, once the problem has been contextualised, on the challenges facing the design of a bell tower today and the different ways of tackling it. The research carried out from the practice of the project assumes architectural practice as an experimental method of knowledge on which to conclude later.

For the analysis of the results, the three questions formulated by the owners are addressed, together with a series of topics specific to the typology of the bell tower or that emerge from the proposals presented. From the specific answers, conclusions can be drawn that help to contextualise the problem and future lines of research regarding such a characteristic typology (Figure 5) (Table A2, Appendix B).

4.1. The Space Generated

The first type of space generated by the bell tower proposals is the exterior space around the bell tower, which is historically important and often associated with important places in the city (Aymá González 2007; Corbin 1998; Price 1983). All vertical structures must land on the ground. Although this is a mandatory issue in all vertical elements, some of the proposals work on the public space generated around the tower, emphasising the relationship between that horizontal public space and the vertical one. How does a bell tower reach the ground? How does the square meet the tower? What can a vertical element offer to the campus space, to the students, and to the existing chapel? The work on the space surrounding the bell tower has some provocative proposals, such as the creation of agoras (7, 11); assuming the condition of a proper meeting place as in the classical urban typology (Alan) or spaces that exceed the primary demand of the university but that are committed to offering added value (8); working in these cases with the height of the square, modifying the ground from which one is born and offering an important load of mystery; and understanding that it is typical of sacred architecture, beyond whether or not it is strictly obligatory (Fernández Cobián 2000). The other strategy for working with the exterior space is based on the fragmentation of the architecture, proposing habitable interstices (2, 4, 5, 9). In all cases, there is a reflection on the urban and nearby scale of the campus, understanding that a landmark like this changes the dynamics of occupation of the university space (Galvez-Nieto et al. 2023) based on the creation not only of a symbol, which already implies an important regenerative power (Valdez and Romero-Guzmán 2022), but also of a recognised and concrete public space.

Furthermore, many projects generate their own, almost individual, interior or exterior space. This space, which did not form part of the initial programme, opens up an interesting debate and transcends the central commission, being one of the discoveries of the workshop's work. Can one speak of interior spatiality in a pre-eminently symbolic element designed to look outwards? Can bell towers be hybrid, multifunctional, or places of observation? (Price 1983). Practically all the projects have images of the close-up scale or these generated spaces for the lived proximity, not only as signage for a place. Even those in which the cross predominated as a centre and motif are concerned with generating habitable spaces, as if architecture were incapable of renouncing them (1, 2, 4, 7, 11).

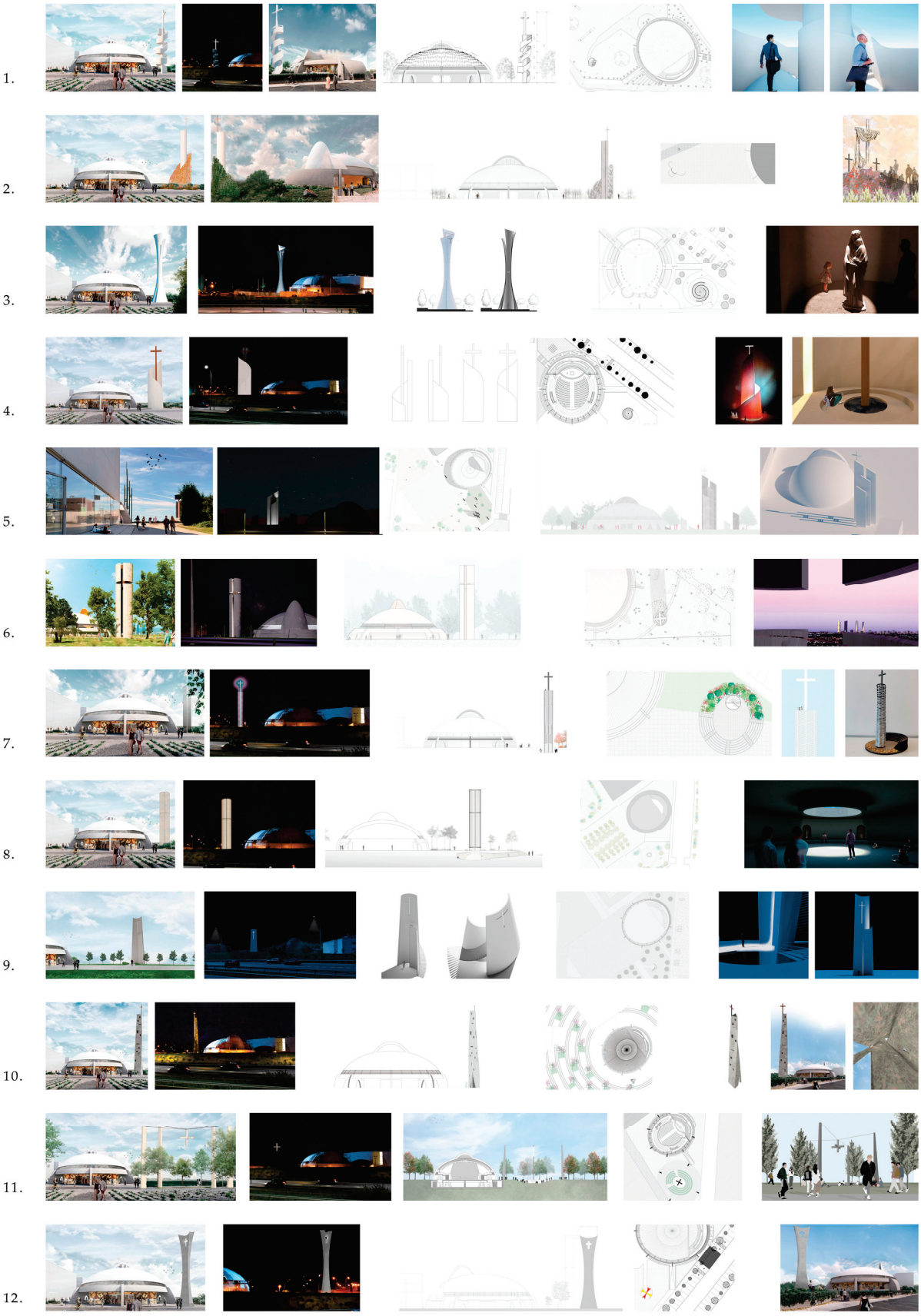

Figure 5. The bell towers proposed by architecture students for the new bell tower of the UFV. Projects Authors are described in the Table A2, Appendix B.

On the one hand, some projects raise the possibility of 'inhabiting the bell tower'. The tower generates a useful, habitable, and commonly used interior space. From this point of view, it is proposed to recover the historical functions of the tower, such as looking out from a height (6), although initially with a defensive character (Frost 1995; Price 1983); the ascending route (1, 6, 7); or to generate an interior space for contemplation or transcendence, even having almost the character of a chapel (2, 3, 4, 10).

4.2. The Symbolic Function vs. the Original Function

Analysing the results of the work, it is striking that they all incorporate the symbol of the cross, the Catholic religious symbol par excellence[5]. The cross still survives in a world where symbols have gradually lost significance in favour of experiences. It stands out as a recognisable symbol and as almost the only symbol capable of transmitting the Christian message today (Barrie 2012). The desire to convey that it is a Catholic university undoubtedly influenced the decision. However, it is significant that, in the end, all the proposals were 'forced' to incorporate the symbol, even if only discreetly on some occasions. Neither bells, which were hardly present in some projects, nor clocks (directly disappeared), elements typical of bell towers, endured (Azanza López 1998). With the survival of the cross, the communicative and symbolic function seems to have won the battle even against the sensoriality of the 20th and 21st centuries, which seemed to be ending all kinds of symbolism in favour of a more phenomenological, or at least more abstract, approach (Martínez-Medina 2013). As in the bell towers of Higueras and Fisac, which were previously studied, the cross is the highest point of practically all the proposals and constantly linked to the Catholic tradition (Norberg-Schulz 1980; Focillon 1972). If, as early as the 12th century, the cross was favoured over any other symbol for crowning the bell tower, we can affirm that the power of the symbol has endured over time (García-Asenjo Llana 2016).

The nocturnal artificial lighting, present in all the proposals, represents a contemporary contribution to the bell tower and the confirmation of its position on the motorway, its need to stand out even at high speed by standing out against the surrounding landscape, and being able to be understood at a glance. Studies into the restoration of bell towers today have offered a new perspective on this, pointing to the need for significance and illumination at night so that their function does not become obsolete in a world where 24 h count (Cicala 2024; Price 1983). The importance of the bell tower appears as an urban landmark, also at high speed, in a function typical of the 20th and 21st centuries, establishing itself as a symbolic element in modernity (García-Asenjo Llana 2016).

4.3. The Construction of a Monument: About the Architectural Language

The construction of the symbol has been approached using two main strategies, which coincide with the approaches to modern architecture stated by Frampton (1995), where the function is overwhelmed by material and constructive expression. Applied to the workshop results, the choice of materials and their use define their presence in the landscape, seeking different paths of contemporary monumentality. The two strategies or trends defined by Frampton are tectonic, where architecture emphasises its construction, its materiality, its physical presence, and the creation of space, and representative or symbolic (Frampton 1995), in which the expressive charge is left to the symbol, in this case, as we have seen, the cross.

In the first group, which we will call tectonic, the expressive charge lies in the architecture, the tower, its geometry, its slenderness, and its materiality (3, 5, 6, 8, 9, 10, 12). They propose an architectural element as a monument or a visual reference. Their main aim is to signpost a place using a monumental element that can be seen and distinguished both from the campus itself, from a distance, and from the road in a way conceptually

similar to Higueras' Church of Cana. The forms are defined and are mainly constructed from solid materials that underline the sculptural condition of the bell tower, with significant variation in its vertical development (3, 5, 9, 10, 12) and that when it is more straightforward, cylindrical (6, 8), it is because it encloses a unique space but which, in turn, gives the tower a significant presence. In this way, tectonics is a physical assemblage of materials and a symbolic language based on the construction itself, materiality, and even sensuality (Frampton 1995; Pallasmaa 1996). The debate surrounding these proposals raises the need to incorporate elements such as crosses or bells to give meaning and identity to the architectural monument, which has value in itself.

A second strategy is to give prominence to the symbol of the cross, entrusting it with the entire symbolic burden (1, 2, 4, 7, 11). This strategy would be representative or symbolic (Frampton 1995), in which the concrete image and the cultural or ideological burden of the architectural form are prioritised. The function of the bell tower is then produced directly: once the need for bells has been overcome, their symbolic function remains, but this is sufficient to give meaning to an environment beyond form (Norberg-Schulz 1980). The architecture then appears as the minimum structure to sustain it (1, 7, 11) and to shelter it (2, 4). Here, a dialogue appears between the architectural element and the symbol that crowns it, as well as the hierarchy and the proportions between the shaft and capital, as in the classical orders. The materiality in these cases never competes with the symbol, which is respected from a distance by showing its pre-eminence. This stance would be more conceptually related to Fisac's proposal in Dominicos. However, in its most abstract way, it could be linked to some of Jencks' (1977) postulates, in which architecture needs symbols to have meanings. The appearance of vegetation (2) or braids (7) and cables (11) emphasise this idea, even in those of more robust materiality (1 and 4), in which the most solid parts are always at a significant distance from the cross. For Jencks (1977), this architectural strategy would function as a double code, communicating with the recognisable past and the contemporary present.

4.4. Veredict

After the presentations, on the day of the final jury, comments were heard from university authorities and prestigious guest architects. Although they were satisfied with all the projects presented, two caught their attention. The first was the number 5 (Figure 6), which was composed of a series of screens that offered different views depending on where you were looking from (motorway, campus, surroundings, etc.). The project recovered some classical elements (the bells within its walls and the measurement of time based on the changing shape of the shadow depending on the time of day) and, at the same time, offered a mysterious and contemporary image in which there was a certain ambiguity in terms of the extension, height, and number of elements capable of engaging in a dialogue with the spectator.

The other project chosen, which was the starting point for the final design of the new bell tower, was number 11 (Figure 7): four masts oriented along the cardinal axes supporting a floating cross over an agora delimited by the four masts. Surprising in its typological dissolution, the proposal barely maintained the functions of representation and congregation, proposing a new architecture for a bell tower to the point that it can hardly be called such.

Figure 6. Project nº 5. Authors: Alfonso Cecilia, Belén Goday, Vanesa Ivanova, Pablo Hernández, and Myriam de Mesa.

Figure 7. Project nº 11. Authors: Marta García, Pablo Heras, Santiago Collar, Krystian Janosz, and Isabel Úrbez.

5. Conclusions

The collection of bell towers exhibited here invites a reflection on the symbolic function of architecture and especially on the relevance of recovering it in a typology such as the bell tower. Aldo Rossi, in *The Architecture of the City* (Rossi 1966), would include bell towers in what he calls 'permanent typologies': forms that are maintained over time because they have acquired meaning within the collective memory of the city and therefore have been invested with symbolic significance. Even though they have lost their original function (Vicens y Hualde 2012; Foulds 2016; García-Asenjo Llana 2016), assuming that they have lost their role as a sound call to prayer, the bell tower as a typology continues to be relevant in the need for churches to communicate with the faithful (Vicens y Hualde 2012; Delgado Orusco 2009; Aymá González 2007), that is to say, a specific semiotic relationship is established with the spectator (Jencks 1977). The workshop experience reinforces the fact that, in some way, the function of the bell tower has been redefined: what initially appeared as an architectural consequence of a functional and structural problem (Ivorra Chorro 2002), that is to say, its representativeness, has become the centre of its function, establishing itself as a field of experimentation on how contemporary sacred architecture can construct an identity, be a visual reference, and adapt to the challenges of the present without losing

its relationship with history, with the symbolic, and with the faithful themselves (Vicens y Hualde 2012; Fernández Cobián 2009).

Through the UFV workshop, the bell tower somehow materialises the profound relationship between architectural construction and the construction of identity. It shows how the 'bell tower symbolically recalls with its presence the possibility of founding a place in the face of a fluid and amorphous environment' (Aymá González 2007). Moreover, how architecture is capable of always giving more than is asked of it: an interior or exterior space, a sense of scale, an unexpected question, a solution to problems that one did not even know existed, and always a specific idea of community, of encounter, of a habitable place for people. A role that bell towers have played from the beginning as mechanisms of social cohesion is by marking the time and space of the community (Corbin 1998; Llop i Bayo 2020), and, in the contemporary context, they can mean, through new architectural forms, a reconsideration of their role in public space, promoting interaction and identity, and transcending the religious to become functional, urban, and symbolic landmarks at the same time (Price 1983).

In this sense, it is important to highlight the projects chosen by the client (5 and 11), which are very different from each other, with two radically different architectural approaches (one more tectonic and the other more symbolic) but which explicitly work with something that was demanded at the beginning by the Rector of the university: the concept of mystery, the raising of questions. The first (5) from its form gives rise to a changing image, with a dynamic image. The second (11) is through the dissolution of typology and the development of gravity. In the architectural conception of both, the distant view of the motorway is fundamental, as shown by a lesson learned from the bell towers of the nearby masters Fisac and Higueras.

The sacred architecture of the bell tower today stands as a questioner and finds its success insofar as it is capable of confronting the viewer with a transcendence that appears reflected as an enigma (Ramos Alderete 2021; Adorno 1970), establishing a singular relationship between architecture and person in which the symbol is not enough (Breitschmid and Olgiati 2019), but rather a questioning, sensorial experience is also offered: the symbolic is renounced, taken only to its foundation, the cross, in favour of a direct, formal, honest, and, in a way, spectacular relationship with the spectator, who is capable of being moved (Martínez-Medina 2013).

Significantly, the 'winning' project proposes maximising the two main requirements—a reference symbol and a public space—but dispenses with the architectural typology of the 'tower', which in itself historically conveyed meanings related to transcendence, identity, and power (Norberg-Schulz 1980). One wonders if this is the essence of the modern bell tower. Having been purified to the maximum, in an exercise of constructing the bare minimum to give a place new meaning, only the cross, the square, and the mystery remain: a symbol, a meeting place, and something that connects them and that is not entirely understandable but which, nevertheless, is capable of connecting and of welcoming people around a place and a faith—the true meaning of bell towers today (Vicens y Hualde 2012).

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Appendix A

Table A1. Students who authored the projects: The project number is related to Figure 5.

Nº Project	Authors
1	Daler Álvarez, Francisco Serrano, Juan Carlos Rodríguez, Esmeraldo Chinguto, Aina Romero, and Elsa Narganes.
2	Ana Pascual, Gabriela de los Reyes, Sofía Morán, Marcelina Owono, Andrea Baños and María Cervera.
3	Jaime Lombardía, Cristina González, Pablo Martínez, Seppe Hooybergs, Ignacio Casanova, and Alberto de Wachter.
4	Miguel Casquero, Melissa Córdova, Araceli Ferrá, Ulises García, Marcos Herrera, Gonzalo Martín.
5	Alfonso Cecilia, Belén Goday, Vanesa Ivanova, Pablo Hernández, and Myriam de Mesa.
6	Gonzalo Sánchez, Pol Fernández, Marcos González, Camila López, and Javier Lozano.
7	Rosalía Peiró, Jorge García, Carlota Muñoz, and Pedro Méndez.
8	Ignacio Segura, Gabriel Mascaraque, Beatriz Capitán, Marta Tejerina, and Jaime Andreu.
9	Ignacio Pardo, Javier Hernández, Fiorella Alberti, Elena Pérez, Rodrigo Gómez, and Paula Real.
10	Jaime Parra, Elisabeth Gutiérrez, Daniel López, Lucía Gómez, and Paula Vidal.
11	Marta García, Pablo Heras, Santiago Collar, Krystian Janosz, and Isabel Úrbez.
12	Marina del Barrio, Aura Mahecha, Andrés Gonçalves, Gabriela Serrano, Marc Jabrega, and Teresa Pardo.

Appendix B

Table A2. Taxonomy of the projects according to the main questions proposed by the university: The project number is related to Figure 5.

Question	Topic	1	2	3	4	5	6	7	8	9	10	11	12
The space generated	Public space		x		x	x		x		x		x	
	Own space	x	x	x	x		x	x			x		
The symbolic function	Cross	x	x	x	x	x	x	x	x	x	x	x	x
	Bells					x							
Architectural language	Tectonic			x		x	x		x	x	x		x
	Symbolic	x	x		x			x				x	

Notes

1 Remarks by UFV Rector Daniel Sada on the first day of class, Tuesday, 12 September 2023.

2 See note 1 above.

3 The original full quote is "It takes me back to when these spiritual principles informed the society. You can tell what is informing a society by what the tallest building is. When you approach a medieval town, the cathedral is the tallest thing in the place. When you approach an eighteenth-century town, it is the political palace that's the tallest thing in the place. And when you approach a modern city, the tallest places are the office buildings, the centres of economic life." (Campbell 1988, pp. 118–19).

[4] "If in ancient times it was possible to distinguish a building by its specific shape or by specific elements (bell tower, orientation . . .), today it is almost impossible because "everything seems or wants to mean everything. This aspect results in a trivialization and homogenizing levelling of certain architectural elements." (Aymá González 2007).

[5] "The top of the bell tower should be a cross rather than any other symbol", according to David García-Asenjo in his doctoral thesis, referring to the secretariat of the Spanish Episcopal Commission for Liturgy, Environment, and Art (García-Asenjo Llana 2016).

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Article

The Sacred Building and the City: Decoding the Formal Interface between Public Space and Community

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Abstract: The reflection on sacred places continues to assume significant relevance today in urban space production. The public value of sacred buildings has consolidated over time an aggregating sense of community, representing spaces for meeting and sharing. Their historical relevance as spaces for meditation represents for mankind places of personal reflection, while they have always played an important role in the city and in its symbolic and spatial structure. Thus, starting from the hypothesis that the sacred space is affirmed as an interface, because it welcomes the individual and serves the community, we examine the architectural features that enhance this ambivalence, exposing transition systems between private and collective spaces, seeking to systematize essential composition matrices for new urban spaces for public use. Assuming Lisbon as a framework, this article proposes a comparative reading between two paradigmatic buildings—Sagrado Coração de Jesus Church and the New Mosque of Lisbon—with similar goals according to the relationship between architecture, place sacrality, and the urban public space. Methodologically, drawing is used as an interpretative tool and, through formal decomposition, this article tries to demonstrate that these buildings are the result of a reflection deeply determined by the value of the place's identity in the city's public space system. According to these case studies, sacred buildings are conceived based on formal and spatial links that are rooted in Lisbon's urban layout. It is sacred buildings that are at the origin of urban places for public use. Each one of these buildings share an idea of architecture with an urban and public role which integrates the objects with the shape of the city and contradicts the tendency for the dissociation between urban elements. In a way, they can be considered paradigmatic examples of architecture with an urban vocation.

Keywords: sacred building; urban architecture; public space; interface space; passages; Lisbon

1. Introduction: Urban Architecture and Sacred Buildings

> *"The unique relationship between the open area of the square, the surrounding buildings, and the sky above creates a genuine emotional experience comparable to the impact of any other work of art".*
>
> (Zucker 1959, p. 1).

Sacred spaces have always played a relevant role in humanity in the construction of a meaning between Man, his spiritual intimate and a specific territory. Through architecture, the sacred space acquires a body and physically and emotionally links mankind to a place. A tension is created between the value of the building as an object and the relevant meaning it establishes within the urban space. The architectural object, through its formal features, constitutes spatial atmospheres that create conditions for individual permanence and reflection, but also for communion with the collective. The sacred building assumes a public significance, a place of meeting and to be with others.

This collective sense[1] has, on the other hand, echoes in the public space around the sacred building. The public space is constituted as a moment of transition that connects the

building and the city, becoming an important piece in the ritual of articulation between the community and the sacred place. The public space builds upon the visual approach and spatial referencing systems (within the urban space), intensifying the symbolic value of the place and imprinting an urban function on the sacred space. In the study of Italian cities carried out by Camilo Sitte in 1889, this dichotomy between religious/sacred spaces (church) and squares is particularly evident, showing, on the one hand, the morphological diversity of the phenomenon and, on the other hand, exemplifying how the public space values the church as an object, while at the same time suggesting that its very position allows it to take up significant spatial wealth in the city.

Furthermore, public space as a more abstract idea finds continuity in the interior space of the architectural object. The collective/communal sense of the religious space dilutes strict limits, constituting in different situations moments of extension and blending between the interior (private) and exterior (public) space. This ambiguity was, to a certain extent, already exposed in 1748, in Nolli's plan of Rome, demonstrating the deep connection between public spaces, namely squares, and sacred spaces, namely churches. In this case, churches appear as natural interfaces for building a community space that serves the collective but also the individual and their spirituality.

This article proposes a reflection on how sacred architecture can be understood as a didactic topic in the construction of public buildings that open up to the city, interconnecting in its structure with public space. To this end, it uses as a support part of the material produced by the research project *Building Typology: Morphological Inventory of Portuguese City*[2] developed within the Lisbon School of Architecture, Universidade de Lisboa, as a methodological and conceptual source. Thus, the examples of the Church of Sagrado Coração de Jesus, a building designed by Nuno Teotónio Pereira and Nuno Portas[3] in 1970, and the New Mosque of Lisbon, a project conceived by Inês Lobo[4] in 2013, both located in Lisbon (Portugal), are taken as paradigmatic situations of sacred spaces that start from the idea of an empty space with a public nature, which structures the entire building's architectural composition.

These two case studies aim to demonstrate the building's potential as a producer of public space, particularly when it has a public value and serves the city. The intention is to show the architectural qualities of the two buildings and how, regardless of the religion they serve, they build public spaces. The Sagrado Coração de Jesus Church and the New Mosque of Lisbon are interpreted as didactic objects for future architectural productions. Architectural production is understood as a support for the collective life of the city.

This article begins by synthesising the methodology and material base that supports it and then reflects on the historical association between religious buildings and urban space. This dichotomy has questioned the spatial limits of public space in several examples, and it is therefore important to discuss how it has redefined the space for collective use. To this end, the two aforementioned case studies are taken as concrete opportunities to observe this phenomenon, regardless of the religion behind the building or the time of its construction. This structure aims to contribute to the debate on the value of religious buildings in the production of public space, but also, through this typology, to reflect on the potential that buildings with a singular character can hold in the design of urban form and in the way we can inhabit cities.

2. Materials and Methods

This article was based on two intertwined research projects. On the one hand, it was based on the typological inventory produced by the *formaurbis* LAB research group, a laboratory included in the Research Centre for Architecture, Urbanism and Design (CIAUD) at the Lisbon School of Architecture, Universidade de Lisboa and, on the other hand, on an individual post-doctoral research project with the theme "in-between in contemporary architecture"[5].

Through the Building Typology research project, the *formaurbis* LAB research group completed a morphological inventory of the Portuguese city. Through exercises of read-

ing and decoding the Portuguese urban fabric, more than 120 cities were inventoried and the various constituent elements of the urban fabric–square, street, block, plot and building—were studied. The Building Typology project dedicated itself to studying and systematizing the different Portuguese typologies, sorting them based on three theoretical categories—Programme, Context, Time[6]—organized by territory mapping and the selection of 120 buildings. Each building (framed in the three categories mentioned) was a case study, representing a typology. A set of comparative tables were added to each of these buildings in order to present the formal diversity of the typology. In this way, the inventory[7] of 120 studied buildings was expanded to more than 700 case studies analyzed comparatively (Figure 1). With this universe of case studies, this article focused on the Context category, which is particularly aimed at studying typologies whose principles are profoundly determined by the circumstances of a context—natural or built (city). In this category, we can observe a set of built typologies that have the particularity of designing the city. Streets, squares or passages are some of the situations created by buildings and which shape or mold the public space of our cities. Based on this inventory, two cases were analyzed, namely a church and a mosque, two religious buildings that affect the design of public spaces, including passage and square. Both are born from the design of public space (Figure 2).

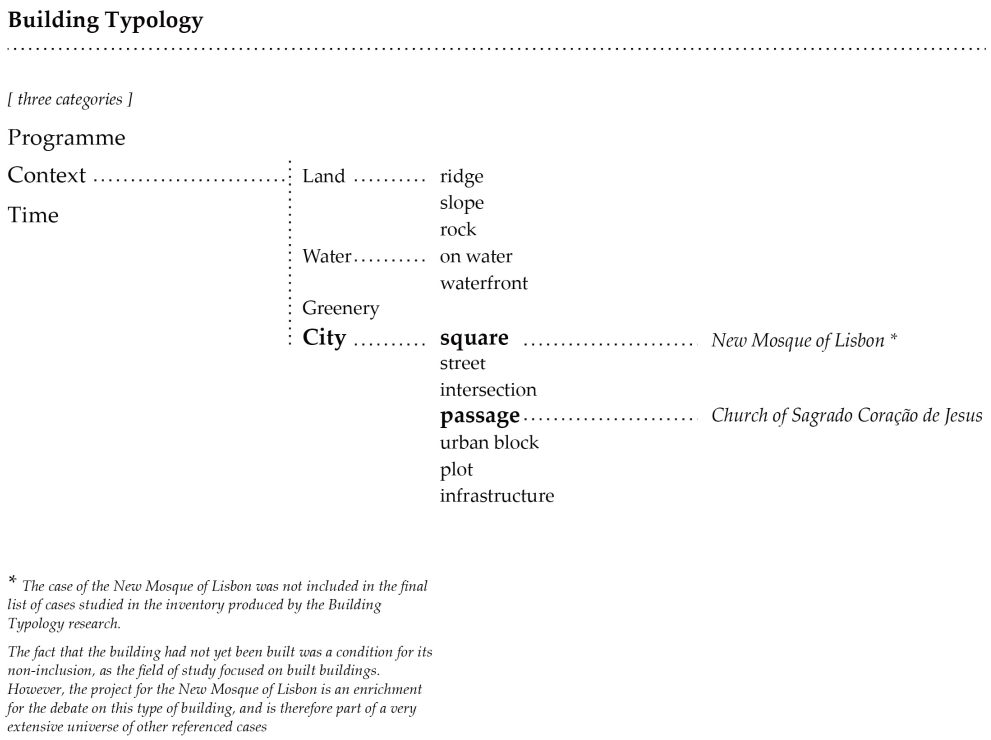

Figure 1. Building Typology, three categories: case studies' identification within the research classification structure.

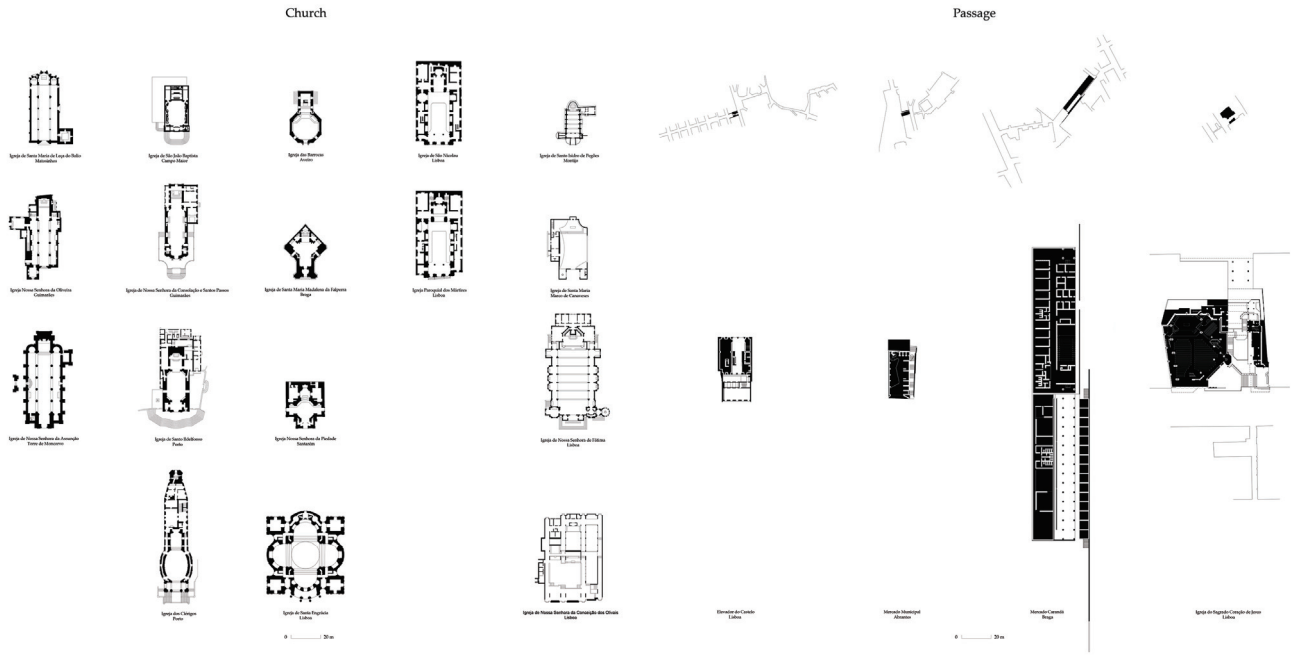

Figure 2. Church comparative table and Passage Buildings comparative table.

It is also important to note that in conjunction with this "Building Typology" research, the post-doctoral research organized a list of examples of architectural works built in Portugal that show a clear concern for designing public or semi-public transitional spaces that seek to build integration spatial systems between building and the urban layout. This list was partially supplied into the "Building Typology" inventory and includes the case studies discussed in this article—Sagrado Coração de Jesus Church and the New Mosque of Lisbon.

Methodologically, this article was based on morphological and spatial decomposition (Christ and Gantenbein 2012; Dias Coelho 2013; Eisenman 2008; Kaijima et al. 2001; Panerai 1999), systematizing through drawings a set of elementary characteristics and systems of spaces that can demonstrate architectural qualities and also that can be transferred to other architectural programs with a public and collective nature. Through the analytical exercise of decomposition (Borie et al. [1978] 2006; Correa 2018; Gandelsonas 1999; Geist 1985; Lampugnani et al. 2019, it is possible to isolate architectural or urban elements (Foscari (2014); Koolhaas (2018); Krier (1983)), making it clear which tools were used to build the supports for urban life (Gehl [1971] 2017). On the other hand, the process of decoding the two examples also sought to highlight the system of spaces configured by the two buildings. This made it possible to visualize the public space generated, which parts and elements constitute it and how it relates to the different functions or services offered by the building.

The case studies were assumed as pedagogical references in the way they constitute project solutions that promote more communal and shared urban living. This study sought to contribute to building an architectural design lexicon capable of supporting contemporary production and disciplinary teaching, always with the aim of highlighting the unique role of the public building as an interlocutor between an intimate (private) and collective (public) space.

3. The Sacred (Building) and the Public (Space): Host, Permanence and Transition

Architectural objects with a sacred meaning, due to their spiritual and religious relevance, appear in the urban fabric in a way almost associated with a position of prominence or notoriety (Fernandes 2014). The symbolic and referential sense is exalted in urban space

not only by the objectual singularity of the building or typology, but also by the dialogue it frequently establishes with the public space.

Although this relationship has an almost ancestral meaning, whether in an urban context or in a territorial and isolated context, in the cases of Greek religious complexes, such as a temple of Athena in Pergamon, built in 2.º century B.C., these spaces served as the starting point for the layout of the precinct, where the relationship between the sacred building and the public space was the result of a new urban framework or the stoas that were built after the temple (Doxiadis 1972). Also, in Roman temples and their connection to the forum, or even the small caves or hermitage chapels where the spirituality is strongly linked to nature[8], it is verified that it is with the emergence of Renaissance thought that this relationship between building and public space is recovered. In Western Christian cities, the dichotomous nature of public–private spaces is clear, unlike other cultures or times, where sacred spaces asserted themselves as their own restricted nature, as seen in examples from Ancient Greece and Japanese Shinto shrines[9]. In this sense, a close link between churches and public spaces was consolidated in the Christian European city.

"*The main squares of each city were indispensable for its daily existence*".

(Sitte [1889] 1980, p. 160)

The process of transforming the churchyard into a square for Notre Dame Cathedral in Paris (Figure 3), Milan Cathedral, and even the Portuguese case of Porto Cathedral provides paradigmatic examples that "allow us to visualize the action of a building of great collective importance on the surrounding public space" (Dias Coelho 2002, p. 175). This process that takes place over several centuries exemplifies a clear intention to value the religious building at the same time that it generates conditions in the public structure of the city to create a space capable of hosting and articulating the community and the building with a sacred meaning. The spatial system that is produced, comprising the square or street which connects us or leads us to the religious building, constitutes a progressive transition between the public and sacred space, a place with greater intimacy.

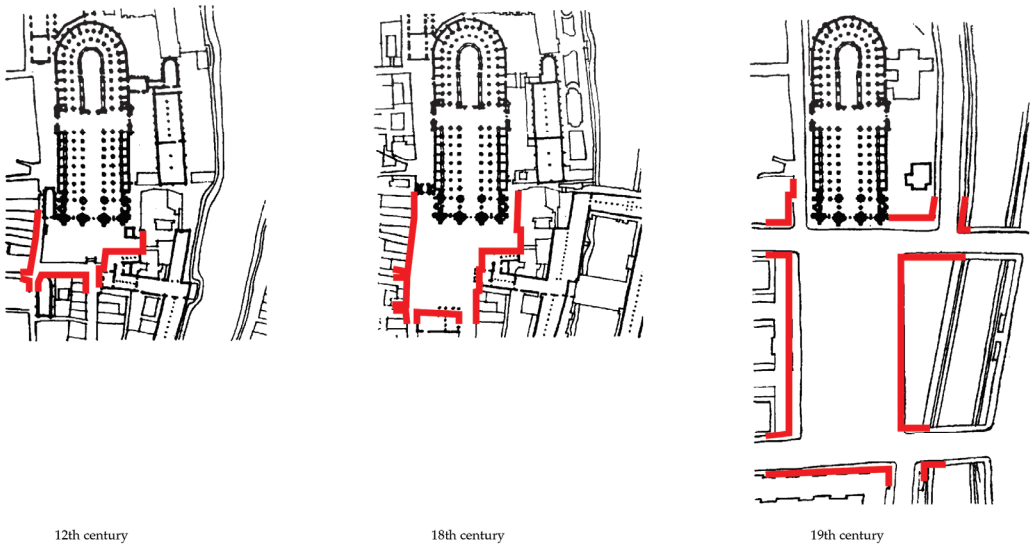

Figure 3. Transformation process of Notre Dame square, Paris.

The square appears, then, as an interface device between people and the building. It assumes itself as a place that marks the church, displays a symbolic object, but also a meeting place, a locale that people assign *permanence* and that precedes the passage to the interior space of meditation. The public space is, therefore, an important instrument of *transition*, constituting one more piece in the system comprising the sacred place and the community.

The urban operations of the 16th century, carried out by Pope Sixtus V, reveal in an extreme way this dichotomy between urban spaces and religious buildings. In addition to the squares that dialogue with the imposing churches, a new stratum is imposed on the city that takes the religious building as a landmark that guides the pilgrim and orders the entire city. On the other hand, with the rise of the Baroque as the dominant architectural language, it appears that the formal dialogue between church and square, or axial system, is developed to a new dimension. The formal composition of the main facade of the building is exacerbated by the formal characteristics of the public space that surrounds it during this period. The use of perspective as a design tool allows for establishing visual connections or spatial sequences that intensify the interconnection between object and space. It is also during this period that the facade acquires a certain thickness, consisting of several architectural elements, such as columns, bases, unevenness, porticos or galleries, which contribute in a decisive way to enriching the system of transition and articulation between the inside and the outside. It constitutes a threshold space that welcomes the collective and prepares the passage of the individual to the sacred place.

4. The Threshold as an Urban Device: The Public–Private Interface

In the close relationship between sacred space and public space, the threshold space becomes evident as a particularly relevant device in the transition between exterior and interior. This spatial fringe is assumed as an important moment, on the one hand, in the recognition of approaching and entering the sacred space and, on the other hand, in the construction of small places of permanence. Courtyards, patios, small variations in the level of the pavement, stairs, benches, cover structures, or other architectural elements contribute to the construction of a thick threshold that articulates the exterior–interior interface, preparing the user of the urban space for the transition into a space of spiritual reflection, at the same time as offering conditions for permanence. The limit between the interior of a religious building and a public space is not defined as a simple barrier to be crossed, but rather it becomes a place, a space with a form that offers conditions for appropriation and that becomes habitable (Van Eyck [1962] 2008). The threshold space emerges as an interface between public and private, merging spaces and thus contributing to the construction of an idea of collective space (Boettger 2014). The threshold space assumes an ambiguity of transitions, making the limits where the interior and exterior space begin or end perceptible and, at the same time, affirming whether it is private or public property[10].

To a certain extent, this spatial value was also identified by Alison and Peter Smithson (1974) in their text "The Space Between", published in *Oppositions* magazine, where the in-between space is understood as an opportunity to rethink new forms of spatial relationship between the built and the city (Juárez Chicote and Ramírez 2014).

Although the text is more than 40 years old, the reflection of these British architects is extremely current. The idea of exploring a thick and habitable threshold in the design of the city asserts itself today as a device of spatial and architectural composition that contributes to the integration between urban elements, building and square/street (Silva Leite and Proença 2020), dissipating rigid boundaries that block greater fluidity between the various types of space. The symbiosis between public space and sacred building is consolidated and a system of integrated and inseparable spaces is constituted.

> "*Physical urban quality is in the measure, the proper understanding of the limits of a space. As soon as we define it, we segregate it. Good public space has no limits*".
>
> (Solà-Morales 2010, p. 31)

5. The Sacred Building as a Generator of Public Space in Lisbon: Sagrado Coração de Jesus Church and the New Mosque of Lisbon

In Lisbon's urban form, the permanent dialogue between public space and religious places, consisting mostly of Catholic temples, finds echoes through various spatial relationships (Figure 4).

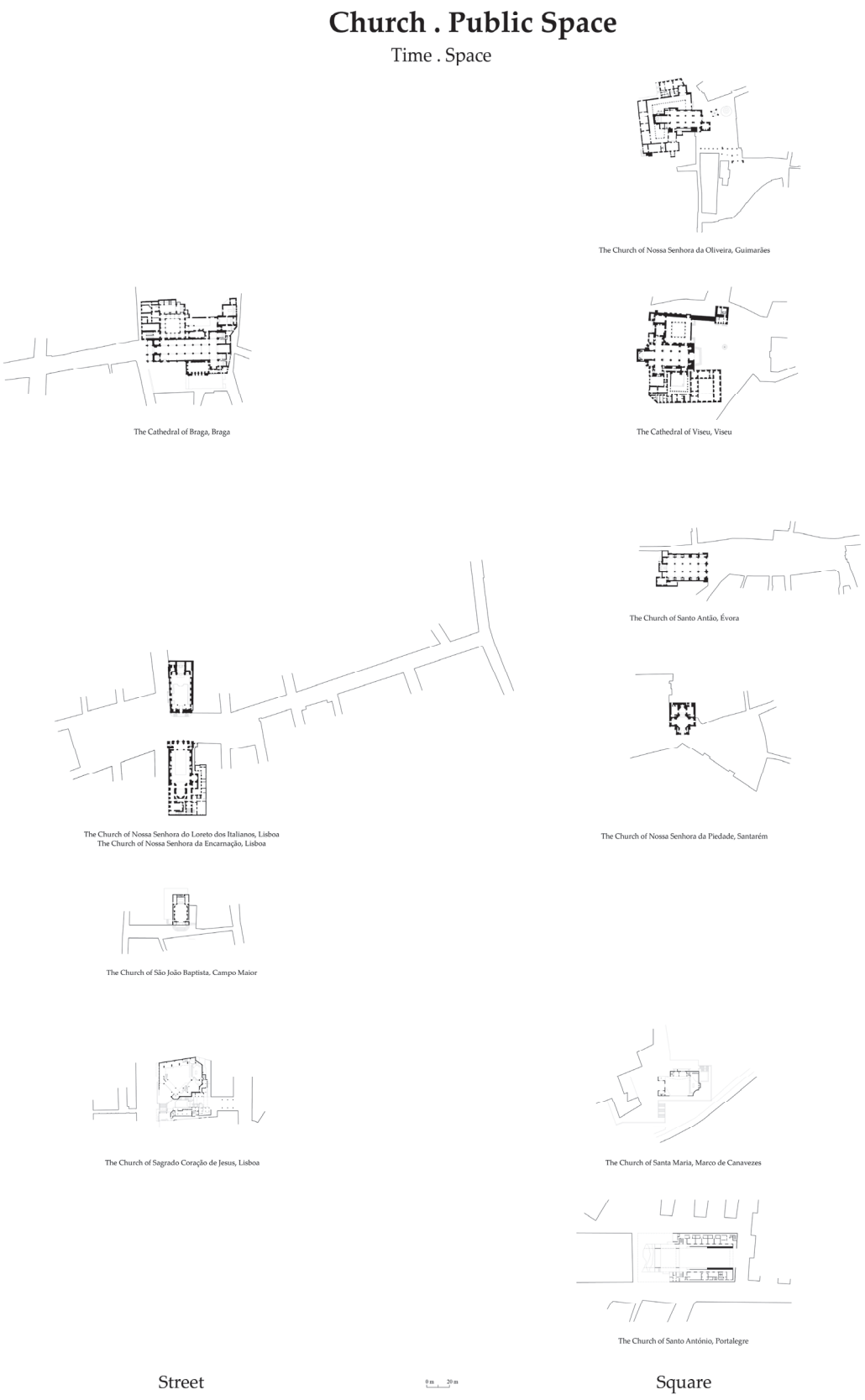

Figure 4. Comparative table: Some relationships between churches and public spaces (squares/streets) in the Portuguese urban context. Through an axial organization, the examples are ordered by time (oldest at the top) and space, street (**on the left**) and square (**on the right**).

The church–square relationship is, as a rule, the most observed, expressing more clearly the symbolic value of the architectural object before the public space and the city.

However, there are examples where the compositional relationship is established in a more axial way, having the street as an anchoring element, and where the positioning of the church seeks a more anonymous integration into the built fabric. Even so, one can observe the existence of transitional spaces, such as small churchyards or staircases that mark the moment of approach to the object and establish a space for the community to meet in the urban fabric.

Following the Second Vatican Council (1962–1965), there are some examples of religious architectural production in Lisbon that seek to open up the religious space to the community. Cases such as the Sagrado Coração de Jesus Church (1970) and the Parish Church of Nossa Senhora da Conceição dos Olivais (1988) are examples of authentic religious complexes where various activities are brought together to expand the sacred space in order to serve the community in a deep collective spirit.

In this respect, the Sagrado Coração de Jesus Church, built between 1962 and 67 but only inaugurated in 1970, represents a milestone in the production of religious spaces in Portugal, not because of its formal and organizational characteristics of the space but mainly because of the way it connects to the city and to the urban layout.

From this work, several examples followed, understanding the empty space around the religious complex as a place for the expansion of religious activity itself and as a space for connection to the community in a broader way. In this sense, it is important to look at this case, understanding the formal links it establishes with the public space, namely in the way it affects the design of a street, and to simultaneously observe the recent project of the New Mosque of Lisbon, regarding the way in which it also defines a collective place based on an interior square. Although this building has a different religious foundation, it has the same public vocation and has developed a strong relationship with the public structure of the city.

5.1. Sagrado Coração de Jesus Church

Sagrado Coração de Jesus Church, a project by the architects Nuno Teotónio Pereira and Nuno Portas, both progressive Catholics and belonging to the MRAR[11], shows a deep sense of progress influenced by two important events—the aforementioned Second Vatican Council (which redefined a new relationship between the Eucharist and the community) and a certain democratic spirit that was beginning to effervesce in Portuguese society. The interior space of the church assumes the configuration of an amphitheater, a large audience, and the religious building constitutes a built complex that constitutes an idea of "microcity" (Grande 2021).

It is precisely this urban sense of the church that makes it a truly unique case in the Lisbon context. Inserted in the middle of the urban block structure, this church seeks a certain discretion, integrating itself into the urban fabric and privileging relations of continuity with the urban layout of the city. This sense is also reinforced in the conceptual process of the formal composition of the entire building complex. The building is born from a massive block (Proviência and Baía 2019) from which a passage is theoretically subtracted, which assumes the double function of, on the one hand, fragmenting the block into several volumes and, on the other hand, establishing a transversal connection in the plot[12], connecting two streets that delimit the urban block where the church is located.

In this way, this passage directly determines the architectural shape of the entire religious ensemble, while at the same time giving it a centrality and a symbolic meaning (Figure 5).

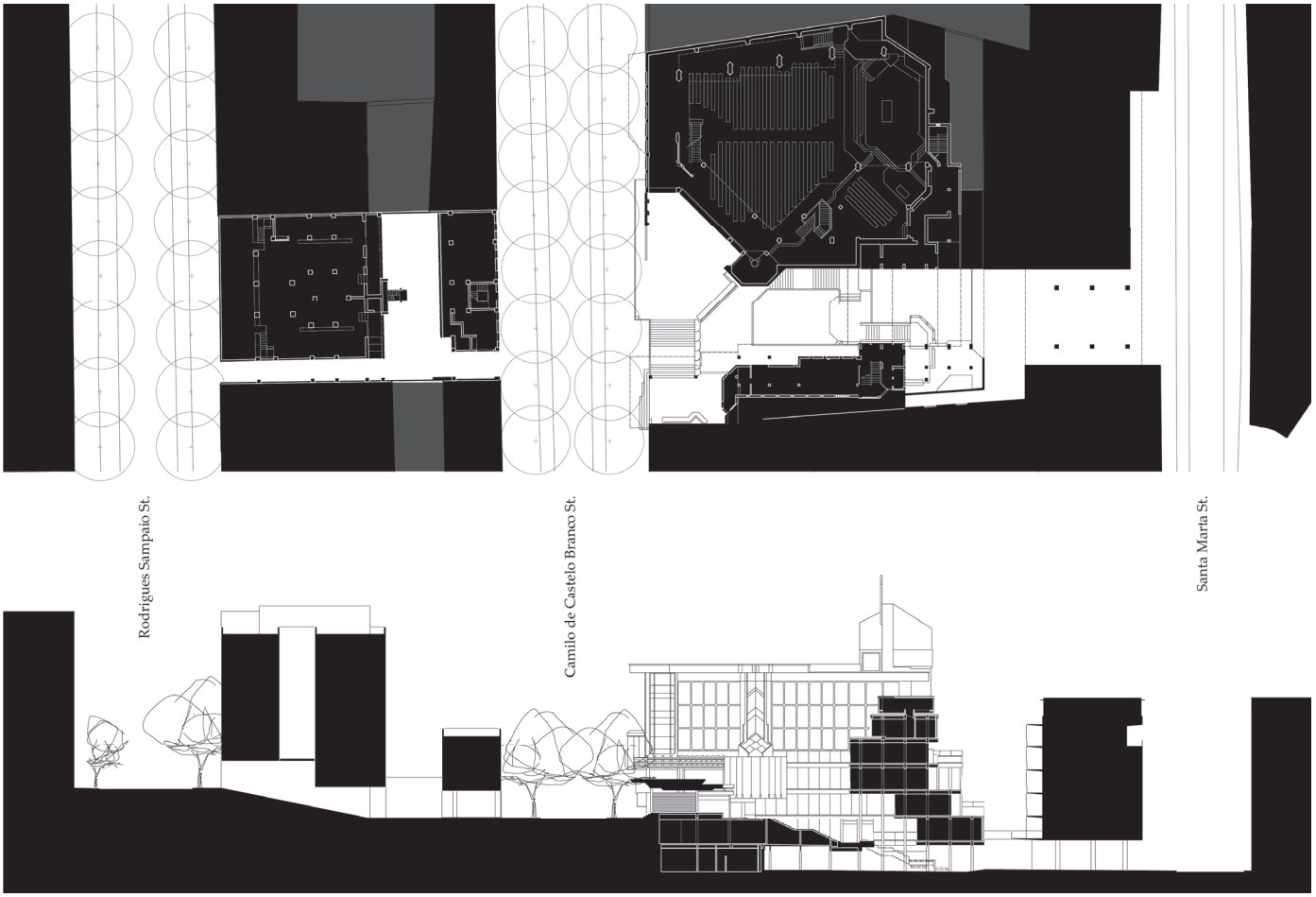

Figure 5. The passage produced by Sagrado Coração de Jesus Church: plan and section.

The importance of the passage is such that the various activities and functions that make up the entire complex are added to it. The passage embodies a public sense of the street, a gravitational line where community and collective spirit meet.

This empty space is the structuring and supporting element of the building's religious life, but also an element that ties the project to the city. This passage. which articulates a unevenness of about 7 m between the two streets, assumes itself as a street–staircase that dilutes limits and integrates into the urban layout and the daily dynamics of the city and the people of the neighborhood.

However, the relevance of the passage in the relationship between church and city is not synthesized only in the connection that it provides, or in its relevance as a void in the volume composition. The morphological features themselves and the various architectural elements that compose it configure a system of spaces and sub-spaces that are discovered along its path (Santana and Cunha 2020). The shifts between darker, open and wider spaces constitute spatial composition strategies that give human scale, factors of surprise or discovery that lead the user to different uses or religious spaces (main hall, mortuary chapel or study rooms and community meeting), or simply invite people to remain in the open space, sitting on the handrails between the stair platforms, on a bench or on an esplanade that extends from a restaurant area (Figure 6).

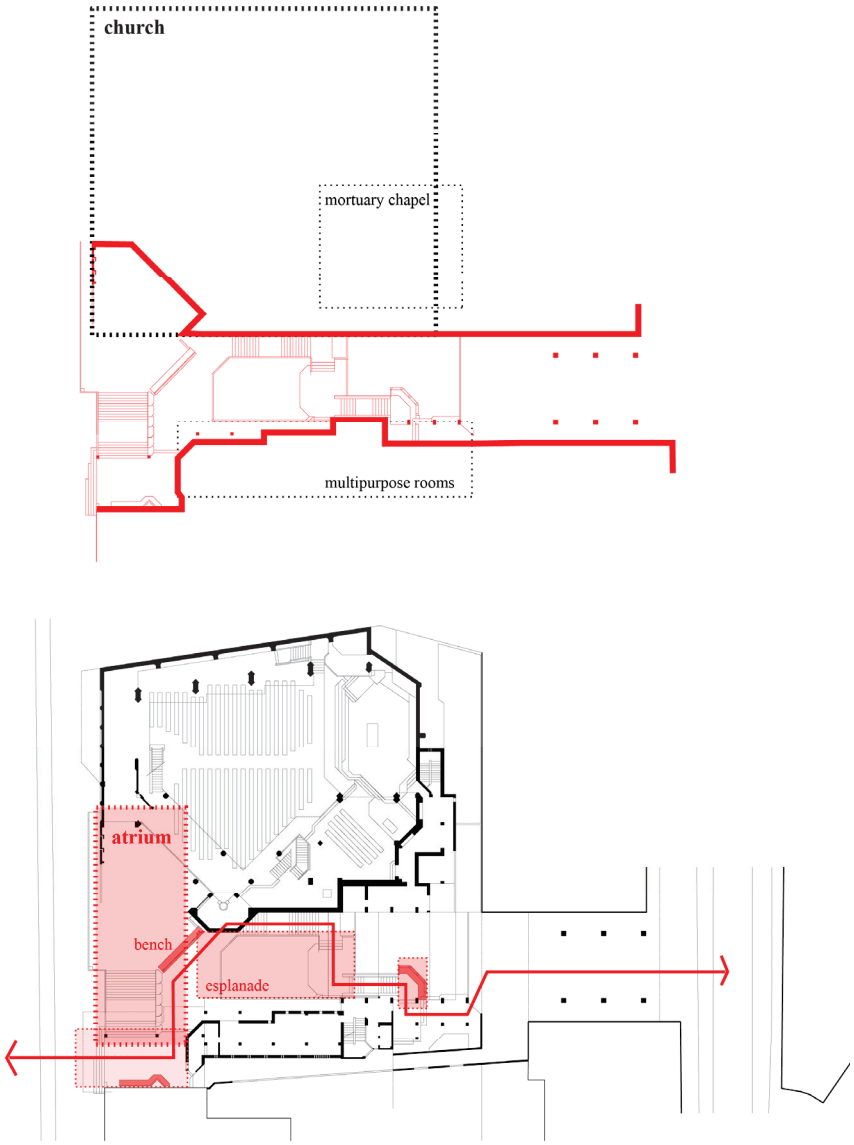

Figure 6. Sagrado Coração de Jesus Church passage system: collective places, permanence elements, functions.

This constant dialogue between the passage and the building is also particularly evident in the way that the architects designed the entry point. It opens into a small churchyard, connected through the passage, but not directly to the city's public structure. It is through the passage that it is possible to enter the sacred place. However, it is a twist in the main façade that announces the passage and indicates the access.

This detail expands the public and structuring sense of the passage. Another determining aspect of the passage is its domestic spirit. Despite its clear public vocation, the passage preserves intimacy, a certain idea of privacy, where the community finds a place to meet and share. This atmosphere is reinforced by the volumetric dialogue that is composed between the void and the built, in a sharp contrast created by the proximity between the different bodies of the architectural object. Complementarily, the certain verticality of the space will collaborate for a reading of a more contained, restricted, private place. It is in this ambiguity that the collective sense flourishes, fulfilling the desire expressed by the architect Nuno Portas to the Arquitecturas magazine in 1971, where he says that he would like the space to "stimulate activities where the sacred becomes profane and the profane becomes new sacred"

The passage welcomes the city's public activity, making it a natural extension of the religious space, making the intimate and the collective compatible in a complex and stimulating spatial symbiosis (Figure 7).

Figure 7. Sagrado Coração de Jesus Church photographs. Source: João Silva Leite, 2022.

5.2. New Lisbon Mosque

More recently, a project a new mosque appeared in Lisbon, which ignited a public debate on the relevance of a religious building as an aggregating element of a community, thus allowing its progressive integration into Lisbon's civitas. The project was promoted by the Municipality of Lisbon in collaboration with the local Muslim community from Bangladesh in order to respond to the growing needs of the Muslim community in the eastern part of Lisbon, particularly in the Mouraria neighbourhood[13]. The proposal developed by the architect Inês Lobo (2013) started from a clear and predetermined idea of building a passage between two important streets in the Mouraria area of the city—Palma Street and Benformoso Street.

In this way, the proposal responded to an old desire of the residents of the neighborhood who, since the 19th century, have called for a new connection between Mouraria and Lisbon downtown.

With the expansion to the north of Palma Street through the opening of Almirante Reis Avenue, the segregation between the neighborhood and the west side of the city was accentuated, generating numerous social problems.

It is within this framework that the project sought to act. Starting from a desire to draw a large void between the dense built fabric, the New Mosque of Lisbon is structured

around a square that, through two levels, establishes the articulation between the two streets (Figure 8). The new square, delimited on its sides by the built structure, but opening to the streets, asserts itself as a space of continuity of the urban layout, constituting itself as an element of connection and, simultaneously, as a place of aggregation and permanence[14].

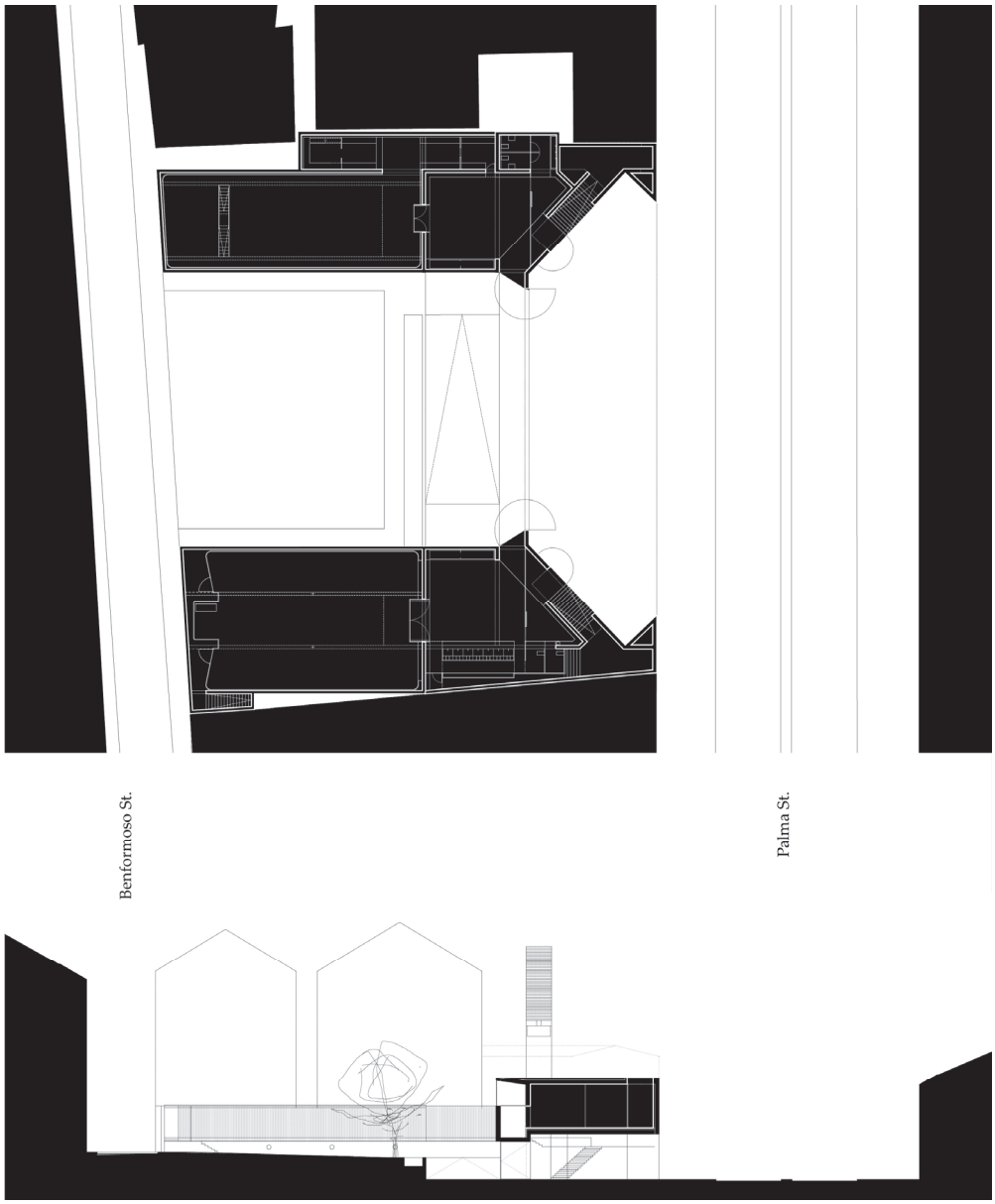

Figure 8. The New Mosque of Lisbon passage: plan and section.

The public square is assumed in this project as a reinvention of the traditional courtyard of Islamic mosques, which have a semi-public nature and which normally play an important role in the transition between the (public) city and the sacred space for prayer. This typological transformation from patio to square intends to open up this space to a wider community, helping to integrate this often stigmatized and segregated population. Thus, in an attempt to centralize the spatial relevance of this public space, the built complex is then organized around the void, having a varied programmatic base that does not just pass through the sacred place. The building contains, in addition to prayer and meditation spaces (male and female), a set of community support rooms, such as a refectory and a communal kitchen, and even two multipurpose rooms, with the intention that one can be used as an art gallery (Figure 9). These uses, which go beyond exclusively religious spaces,

play an important role for the community. The kitchen and refectory open up to a wider community, serving the entire population of the neighborhood, whether Muslim or not.

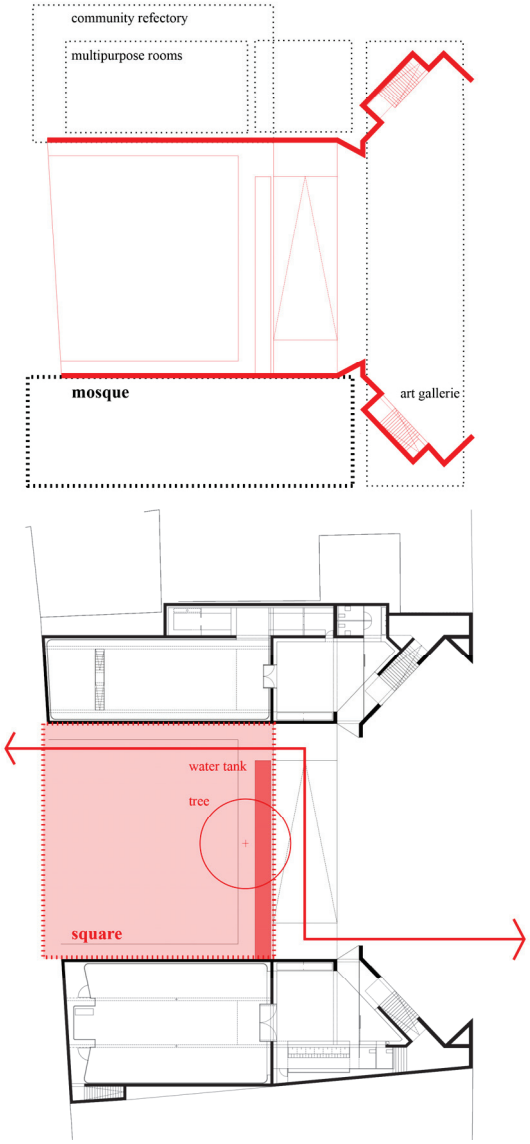

Figure 9. The New Mosque of Lisbon passage system: collective places, permanence elements, and functions.

This collective sense is an important step in the creation of infrastructures that collaborate towards better social integration of the different populations and a certain identification with the place. The public sense of the square proposed by the mosque's design is echoed in the mosque's interior space. The public sense of the building transcends the physical limits of the building itself.

As in the case of Sagrado Coração de Jesus Church, in the project of the New Mosque of Lisbon, it is also possible to identify a set of formal solutions, architectural elements and programmatic strategies that intend to create the public place, the space capable of asserting itself as a new point of gathering of the collective, comprehensive and multiracial. The architectural object, due to its formal and spatial configuration, becomes a true interface between public and private spaces.

Project options such as raising the building from the ground, in front of Palma Street and opening the square to Benformoso Street, enhance a natural continuity between the two streets, smoothing the transition of elevation through a system of ramps that makes

all pedestrian circulation comfortable and quite fluid. In addition to the existing volume (elevated) on Palma Street, it contributes to the construction of the portico (Figure 10), attributing human scale to the passage and constituting continuities in the pre-existing street front alignments. On the other hand, the water tank and the tree placed over the square, on the side of Benformoso Street, and the distribution of the main uses on the side bodies of the building enhance the recognition by people of the space as a place of permanence and social meeting.

Figure 10. The New Mosque of Lisbon render. Source: Inês Lobo Arquitectos, lda. (2013).

6. Discussion: Still Learning from Sacred Building Typologies

> "*Of all the architectural elements, the wall comes first. The primary purpose of a wall is to establish a relationship. Association comes before separation*".
>
> (Khosravi 2021, p. 67)

The sacred building has recurrently been used as a reference over time, and the history of architecture reveals that the compositional characteristics of these buildings have sometimes been reinterpreted and other times transferred to give rise to buildings with other architectural programs. On one side, we can place Hagia Sophia[15] and its main dome, which was successively reinterpreted and was the main reference for the mosques designed by de Mimar Sinan[16]. Meanwhile, on the other hand, we can consider some of Andrea Palladio's villas as a rehearsal of transfers of the characteristics of sacred buildings to the intimate sphere of housing.

Through a parallel look at the two case studies, Sagrado Coração de Jesus Church and the project for the New Mosque of Lisbon, it becomes possible to reinforce the relevance that religious/sacred buildings have in the spatial composition of the city and in the potential to generate places of social aggregation, community and collective identity, in addition to the symbolic and referential meaning that they have has always represented in the urban context. Although the two studied buildings are intended for different faiths, they both produce new public spaces in a very clear way. Both buildings shape the urban structure and are designed as objects based on this characteristic. In the case of the mosque, the creation of a public square constitutes a excellent collective meeting space, both for Muslims and for any other inhabitant of Lisbon. The square, as a reinterpretation of the private courtyard of a common mosque, becomes an interface for sharing and interaction between

everyone[17]. The Sagrado Coração de Jesus Church, on the other hand, creates a more complex system of public space. Along a passage, several places invite people to stay and socialize. Larger spaces, such as the churchyard, and smaller spaces such as a simple bench emerge as devices to encourage the collective sense. This public space structure is therefore more than just a crossing device—it is a place that seeks to serve as an extension of religious activities and also a meeting place for the entire neighborhood community (believers or non-believers).

The formal decomposition of the two cases made it possible to highlight the role that public buildings and specifically sacred buildings can play in contemporary city design and in the design of public spaces. Public program architecture therefore assumes an additional responsibility in the production of collective urban space, not referring only to the symbolic or scenic meaning of the building. Through decoding religious buildings' formal structure, it is possible to stabilize more general compositional principles that could be transferred to the production of other architectural pieces, especially those that have a public character. Thus, as religious buildings assume a structuring relevance in the city, not only due to their symbolic character, but also because they are closely associated with the production of public space, it is important to explore parallels and question the possibility that other typologies of public buildings can incorporate similar formal features, which allow the construction of an identical cohesion between public buildings and public space to that which occurs in the relationship between buildings and cities as established by sacred buildings.

It is perhaps important to recall the thoughts of Manuel Solà-Morales who emphasizes the strategic value of producing public space through the use of private elements that know how to interpret collective space as a factor of urbanity. Spatial ambiguity and the dilution of rigid limits make urban space more versatile and changeable to different circumstances, rhymes and times.

> "*Projects that collectivize. These projects, the most incisive, accept the strategic goal of creating public space with private ingredients, on the basis of an understanding of collective space (public+private) as a defining substance of what is urban. Explicitly or otherwise, such projects take the view that urbanizing means collectivizing, and they may have a lot or a little in terms of form, but they do not shape. Rather, they are actions of mental strategy*".
>
> (Solà-Morales 2010, p. 29)

7. Conclusions

The built typology with public vocation thus incorporates an additional responsibility. The building must assume itself as an interface articulating the public and private (exterior–interior), preserving a collective spirit.

Sagrado Coração de Jesus Church and the New Mosque of Lisbon present formal hypotheses and spatial solutions that instill this sense of interface. They represented objects that actively contribute to the composition of a space that is capable of valuing the architectural piece in itself but is also fundamentally capable of building mechanisms of relationships with the urban place in which they are situated. These objects start from an urban context, interpret it and draw a place (Vidler [1977] 1998). To this end, issues such as the introduction of a certain architectural porosity, where systems of connection between the exterior and interior are strongly promoted, diluting rigid limits and developing continuities between public and private space, are promoted (Benjamin 2019). On the other hand, the constitution of complex systems of approach and transition, sometimes even ambiguous, where one intuitively progresses between the public and private, collective and intimate, recognizing the various stages of a promenade characterized by moments of permanence, walking or passage, can be developed.

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Notes

1 It is clear that the religious building serves as a support for the personal and individual reflection of human beings. Typologically, however, the religious building welcomes multiple people in this exercise of reflection. This fact, combined with the existence of collective religious ceremonies, promotes the meeting and constitution of an extended community based on the idea of the common good. Thus, the religious building is often a place of refuge for individuals, but it is also a place of sharing with a strong vocation for the collective use of space.

2 The research project Building Typology, produced by the research group *formaurbis* LAB at the Lisbon School of Architecture, is financially supported by the Foundation for Science and Technology, ref. PTDC/ART-DAQ/30110/2017, with the coordination of Remove for review. Further information: https://formaurbislab.fa.ulisboa.pt/the-building (accessed on 15 February 2024).

3 Nuno Teotónio Pereira (1922–2016), architect, is one of the most remarkable figures of his generation in Portugal and particularly in Lisbon, leading a modern architectural language with several brutalist references. He was one of the founders of the Movement for the Renewal of Religious Art, contributing several works which question the separation between public and private space through a rigid limit. Collective spaces find expression in several of his works, as a way of constituting transition systems between the building and the city. Nuno Portas (1934–...), architect, stands out as one of the most influential thinkers on the Portuguese city in the second half of the 20th century. He began collaborating with Nuno Teotónio Pereira in the 1950s and in 1958 began working with the magazine Arquitectura, where he would become director, and in which he wrote numerous texts that won him the Gulbenkian Prize for Art Criticism in 1963. After 1974, he played an important role in the production of social housing under the SAAL programme and, more recently, he stood out for his theoretical texts characterising extensive urbanisation and intervention in urban planning in the Ave valley region, in the northwest of mainland Portugal.

4 Inês Lobo (1966–...), an architect, represents a new generation of Portuguese architects who are recognised in Portugal and internationally. She has also worked as a curator and commissioner of architectural exhibitions, was responsible for the Portuguese representation at the 2012 Venice Biennale and was the Portuguese delegate to the VIII BIAU–Ibero-American Biennale of Architecture and Urbanism. She was a guest participant in the 2016 Venice Biennale, "Reporting from the front", and "Freespace" in 2018.

5 The post-doctoral research is being carried out by Remove for review at the Remove for review, with financial support from the Remove for review. The research focuses on the study of the intermediate space along a set of road mobility axes located in the Lisbon Metropolitan Area, understanding the processes of transformation of this interstitial membrane and simultaneously identifying the transformative value of the public space that certain buildings are able to play. In this sense, the research develops a parallel analysis of a set of reference examples, singular contemporary architectural objects, which constitute cases of particular interest in the transformation of the design of public space and the way we use the city. These reference cases are intended to constitute a conceptual basis for didactic support and reflection on the problem underlying the research as a whole.

6 The different studies that have been performed on building typologies focus mainly on classifying and ordering the case studies according to their uses, i.e., linked to the specificities of each functional programme. In the Building Typology Morphological Inventory of Portuguese City, it was decided that in addition to sorting the cases by their programme, there should be two other categories that sought to highlight the relationship between the building typology and the physical context (landscape

or urban), as well as building typologies that are the result of several transformation processes due to the action of time. The *Programme* category questions buildings in the articulation between the composition of the built forms and the function of space, produced from types that reveal the multiple possibilities of how architectural spaces that share the same purpose are organized in Portuguese territory. The *Context*, or the support understood as the inherent value to urban and architectural creation, condenses a set of physical, natural and human characteristics, which can be both inhibitors and drivers for the construction phenomenon, as well as interacting in the design process, acting directly about the programme in the composition of the building. This category includes buildings that show adjustment effects or in which the built form and the very organization of the architectural space are determined or profoundly influenced by the physiognomy of the territory, by the material that constitutes a particular site or even by the referential presence of natural elements. In the *Time* category, a reflection on the evolution of built forms is proposed, focused on a critical approach to the recycling potential of architecture. Here are grouped buildings that are the result of a process of successive modifications and whose shape is mainly influenced by the effects of the dynamic action of time. These buildings reveal the resistance of the built forms and are the product of the evolution to which they were subjected, bearing the scars of these mutations in their form. Usually, they are architectural objects that subsist adapted to different functions from those that originated them, and sometimes they are even buildings that are transformed to create other buildings.

7 Each of the 120 buildings has been synthesized according to the same reading matrix. The cases are presented through plans, sections and elevations, an axonometric perspective, a territorial plan, photographs and a summary characterization text.

8 It is important to note that more recent architectural examples seek to reinvent this more isolated sense of individual introspection, sometimes even without a direct and clear association with a particular creed, seeking to make the experience of reflection closer to the atmosphere itself than the architectural object creates, by itself, and/or establishes with nature. Take for example situations such as the Bruder Klaus Field Chapel (2007) and the Wooden Chapel (2018) designed by Peter Zumthor and John Pawson, respectively, or the Monte Chapel (2018) designed by Álvaro Siza.

9 Shinto shrines have a system of pathways (Sando), often surrounded by natural spaces (forest or urban parks), which seek to build a progressive transition between the city and the temple. These paths form part of the overall temple enclosure but are for public use. They are places that extend the public space of cities or are interconnected with leisure routes and the enjoyment of the landscape. Although they are free to use, the paths seek to preserve the symbolic and mythical sense between mankind and nature, acting as a space of preparation and a moment of passage between the common and profane space and the sacred place. For more information on this topic, see Imazumi (2013). *Sacred Space in the Modern City. The Fractured Pasts of Meiji Shrine, 1912–1958*. Boston: Brill.

10 "*... of spatial continuity and the tendency to erase every articulation between spaces, i.e., between outside and inside, between one space another. Instead I suggest articulation of transition by means of defined in-between places which induce simultaneous awareness of what is significant on either side. An in-between place in this sense provides the common ground where conflicting polarities can again become twin phenomena*". in Van Eyck, Aldo. 2008. *Writings. The Child, the City and the Artist*. p. 63.

11 Religious Art Renewal Movement (*Movimento de Renovação da Arte Religiosa*).

12 Nuno Portas testifies to this conceptual principle in the 2019 book "Nuno Portas: *18 obras partilhadas*" edited by Paulo Providência and Pedro Baía.

13 "*Mouraria has a singular reality, were strong typicality and multi-culturality coexist, something that is a singular opportunity to achieve the effective integration of the OTHER, by sharing a common space: the square, a neighborhood or the public space in general*". In Lobo, Inês. "Mosque in Mouraria", in http://ilobo.pt/Mosque%20in%20Mouraria.html. Accessed on 6 January 2024.

14 "*... with regard to buildings, it is a question of resuming the public vocation (...) and of creating new spaces associated with public programs at key points, which allow not only to create local dynamics but also to increase flows and experiences of this territory at the* scale of the city". In Lobo and Varela (2020). "Limite: identificação de um território". p. 16.

15 Hagia Sophia was built to be the Cathedral of Constantinople, now Istanbul, in the 6th century, and became the reference building for the design of mosques in Turkey in the 15th century.

16 Mimar Sinan (1490–1588) is considered the greatest architect of the Ottoman Empire and was responsible for the typological redefinition of the sacred space of Turkish mosques. His work was inspired and strongly influenced by the Hagia Sophia.

17 Typologically, the courtyard in the mosque takes on a mostly private sense with more restricted access. The collective sense is present, but it is intended for the religious community.

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MDPI

Article

Multifaith Room for Pediatric Cancer Center of Barcelona—An Intrahospital Public Space in the City

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Abstract: The internationalization of specialized healthcare emphasizes multiculturalism, requiring adaptable hospital spaces. Sant Joan de Déu (SJD), a leading pediatric hospital managed by a Christian order, has created a multifaith room for prayer and meditation in the main lobby of the Pediatric Cancer Center Barcelona (PCCB). This manuscript presents an unpublished case study, showing the research conducted for the design of the multireligious room and the process of its construction. The methodology includes a bibliographic review, architectural analysis of three meditation spaces, and in-depth interviews with stakeholders. This project highlights SJD's commitment to blending care and design, emphasizing the humanization of hospital spaces. The triad of religion, public space, and society makes more sense here than ever before.

Keywords: multifaith room; multireligious space; meditation area; hospital; SJD; PCCB; Barcelona

1. Introduction

When reflecting today in the 21st century from a Western perspective on the triad of the words "religion" (without specifying which one), "public space" (without detailing any specific one to represent them all simultaneously), and "society" (understood in its most global sense), one considers "multifaith spaces" in general, and specifically the recent "multifaith room constructed in the main lobby of the Pediatric Cancer Center Barcelona (PCCB) at the Hospital Sant Joan de Déu (SJD)", the first building of its kind in the world and a leading reference in international pediatric oncology.

It is necessary to explain from the outset that the authors of this article are also part of the team of designers and architects who have built this multireligious space, collaborating from the beginning in the initial phase of research and reference collection, as well as in the successive phases of design and construction of the room. We believe it is important to clarify this to place the reader in the correct context and to emphasize that academics and university researchers dedicated to design and architecture can also collaborate with private companies that value research, thus facilitating knowledge transfer and building bridges between academia and society.

1.1. Terminology

Before delving into the case study at the heart of this article, it is necessary to specify the terminology used. It must be clarified that an "ecumenical space" is not the same as a "multifaith space" (Biddington 2013, 2021). The former, ecumenical, refers to a space shared among different Christian denominations, mainly divided among Catholic, Orthodox, and Protestant. An interreligious or multifaith space, on the other hand, is much more complex, as if the ecumenical space were not complex enough already, referring to a space of coexistence among different religions. The main ones would be Christian churches in their three cited branches but also Muslim mosques, Jewish synagogues, Hindu stupas, Buddhist pagodas, and Shinto shrines. This also includes all other minor religions not mentioned. Furthermore, these spaces must also welcome those who do not profess any

religion but seek a place for personal reflection and meditation. Many different terms have been used to refer to such versatile spaces, and here we cite the most used ones: Multifaith Room, Quiet Room, Prayer Room, Stiltecentrum, Raum der Stille, Room for Reflection, Meditation Room, Rest and Faith Room, Faith and Reflection Room, Contemplation Room, and Peace Room (Crompton 2013). In this article, we will refer to this space located on the ground floor of the PCCB at the SJD hospital using any of the mentioned terms, prioritizing "Multifaith Room" whenever possible (Figure 1), or "Silent Room" as its proper name for the architectural project.

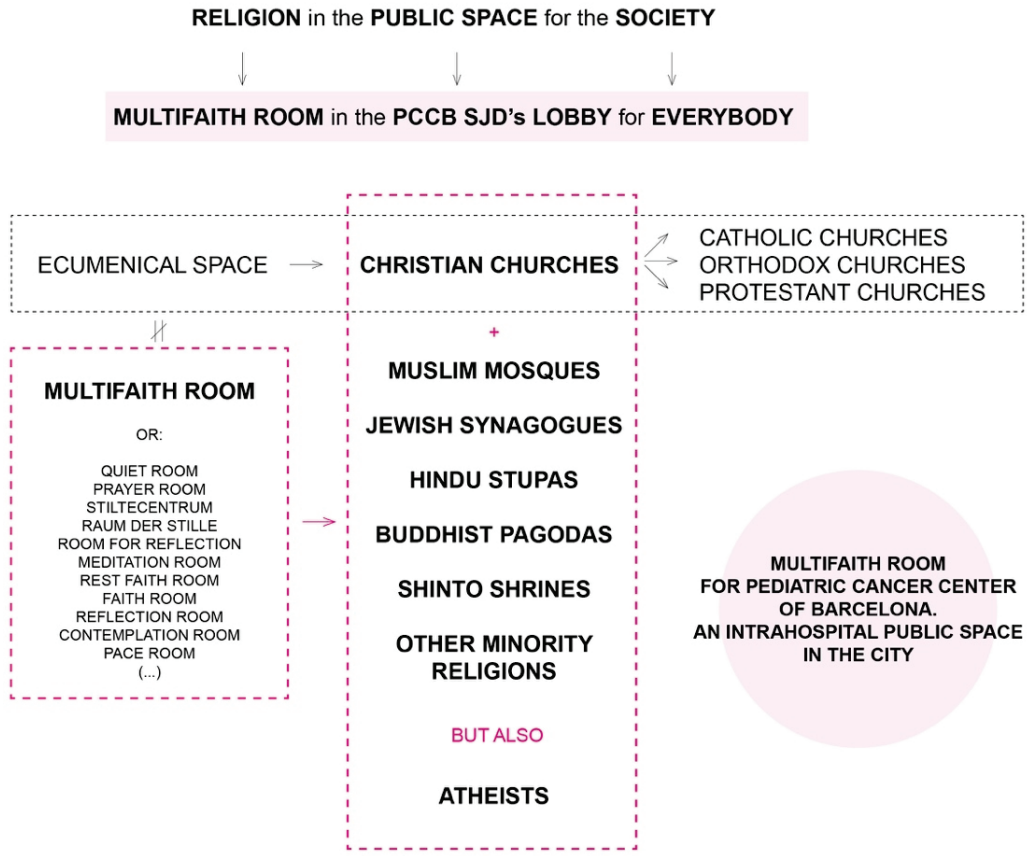

Figure 1. Diagram of the terminology used and justification for the proposal's fit. The authors.

This is important to know because, in hospitals belonging to religious orders, it is most common to find chapels dedicated solely to that particular religion. In more flexible and lenient cases, such as the Orde Hospitalari de Sant Joan de Déu (Hospitaller Order of SJD), there was an ecumenical room, meaning a space for different Christian denominations. Proposing and offering a multireligious space that accommodates different religions and also atheists is innovative and bold. This hospital, internationally renowned for treating children from around the world, has thus prioritized the needs of the children and their families.

1.2. Needs of Each Religion

As Victorino Pérez Prieto explains (Pérez Prieto 2011), architecture, or a certain type of architecture we would add, has a sacred function. While it is true that one can speak to God from anywhere, tradition has dictated that it is easier to do so from certain spaces legitimized by the value given by the community. Therefore, understanding the spatial and architectural needs of temples from each religion is essential to design a space that accommodates all.

The Catholic, Orthodox, and Protestant churches, though born from the common Christian trunk, are very different. In contrast to the austerity of Protestant temples,

due to their liturgical conception based almost exclusively on the Word, the Counter-Reformation created a different type of temple: the baroque, centered on the affirmation of Eucharistic, Marian dogmas and popular piety devotions, featuring a frontal altarpiece and numerous side chapels. This type of temple is now irrecoverable, not only due to changes in architectural tastes but also because the militant ecclesiological conception has been surpassed (Pérez Prieto 2011). Nonetheless, the theological conceptions of Catholics, Protestants, and Orthodox lead to different liturgical concepts that condition their temples: Catholic churches need a presbytery with its altar for the Eucharist, the ambo for the Word, and the presidency, the place for the Eucharistic reserve; Orthodox churches need the sanctuary (altar place for the Eucharist, separated from the people) and the iconostasis (retable with panels for icons, separating the sanctuary); Protestant churches, in contrast, only need the place of the Word (for reading and preaching) and the place of the choir.

Besides Christian churches, the fundamental characteristics of sacred spaces of the main religions are as follows. Muslim mosques have fundamental elements: large courtyards combined with a central corridor for prayer and fountains for ablutions; towers (minarets) for the call to prayer; the wall (qibla) with its niche (mihrab), indicating the direction to Mecca, and the pulpit (minbar); and iwans to separate different sections of the mosque and geometric decoration with arabesques, Arabic calligraphy, instead of paintings (prohibited in Muslim architecture). Jewish synagogues have these elements: a cabinet or tabernacle at the back, with the ark containing the Torah scrolls; in front of it hangs a small lamp that constantly burns in memory of the perpetual light that shone in the Temple of Jerusalem; and the menorah and a lectern table (bimah) or a lectern (amud) placed on a platform (tebá) that acts as an altar for reading the Torah. These elements are present in old and new synagogues. Stupas, ancient Hindu funerary mounds with relics, considered in Buddhism to contain Buddha's relics, were later used as funerary mounds for significant figures and became important pilgrimage sites. In Southeast Asia, China, and Japan, stupas transformed into pagodas, representing the Buddhist cosmos: a series of tiered structures ordered according to specific concepts or guidelines. Buddhist sacred places seek to be particularly meditation spaces, especially Zen spaces, on which contemporary architecture has focused more. Finally, Japanese Shinto shrines are very varied but have common elements; the most notable is the large entrance gate (torii) (Figure 2).

We conclude this brief and straightforward synthesis, which aims to contextualize the issues that multireligious spaces seek to address in general, and specifically in our case study. For further information, refer to the various volumes of *The Encyclopedia of Religion*, which accurately, extensively, and systematically document the needs of each religion (Eliade and Adams 1987).

1.3. Paradigm Shift

Beyond the specific needs of each religion and the relationship between architecture and the sacred, a generalized trend shift is observed across continents where religion decreases and spirituality rises, leading to less use of large temples in favor of small multireligious spaces in public places (Puttick 1997; Crosbie 2017). Andrew Crompton of the University of Liverpool School of Architecture, one of the leading experts in this field, explains, based on statistical data from the Pew Research Center, that in the UK alone, there are estimated to be over 1500 multifaith spaces, with this number being much higher in the United States and Europe (Crompton 2013). These spaces can be found in "non-places" (Augé 1993), such as airports, shopping centers, and service stations, and also in public or private buildings such as hospitals, prisons, universities, schools, police stations, offices, and government buildings (Johnson and Laurence 2012; Díez De Velasco 2016).

Given the current state of the matter and the general topic in all its complexity, the aim of the present manuscript is to present an unpublished and exemplary case study, showcasing both the research conducted for the design of the multifaith room and the process of its construction and implementation.

Figure 2. Collage of interiors of the different mentioned religions. Free-to-use images extracted from Wikimedia Commons based on the search "interior of…". Selection and collage by the authors.

2. Discussed Results

The results presented below are accompanied by the relevant discussion. Since this is not a statistical study or has data collection where it is easy, logical, and coherent to separate the raw results from the subsequent discussion, it seemed more appropriate for this study to present the discussed results to facilitate the manuscript's readability.

2.1. General Design of a Multireligious Space

Architecturally speaking, the direct ancestors of the modern multifaith room are a few spaces shared by Christians and Jews dating from the middle of the last century, the oldest of which could be found in the United States Army before the Second World War. It is unlikely that they were created for religious reasons; making soldiers share may simply have been cheaper and better for morale than providing separate facilities (Crompton

2013). Shared spaces in airports and schools followed in the 1950s and 1960s. Specifically, the first airport chapel dates to 1952, at The Our Lady of The Airways Chapel, at Boston Logan Airport. Initially Catholic, it became multireligious. From then until today, the number has grown exponentially. According to the *Wall Street Journal*, referring to data from the International Association of Civil Aviation Chaplains, an ecumenical nonprofit organization, at least 140 airports worldwide have designated chapels, and more than 250 chaplains. The same goes for other public and private facilities cited, with hospitals having the longest tradition of housing them. However, it is also true that sometimes hospitals are precisely the most reluctant to convert it into a multireligious space, even detaching them, as in the case of our study's hospital, from its founding religious order.

Thus, based on the conclusions of Crompton's research team published in the cited article, and despite being a present design problem he describes as almost impossible to project, it ultimately seems that such a multireligious space functions somewhat better if it is a confined, empty, white space without symbols, enclosed, and without windows. However, we now ask ourselves: is there not a danger of falling into non-design and relegating these spaces to residual places within main spaces? Building a high-quality multireligious space has been our project objective. Presenting it here in an unprecedented way is the aim of this article.

2.2. Three Exemplary Multireligious Spaces

We have selected three relevant examples for us and for our case study. The reasons are as follows.

On a temporal level, they encompass the past, present, and future of multireligious spaces. The first example, the MIT Chapel, is the earliest successful and well-regarded space of this kind. The second example, Patriarca Abraham, represents the present in the city of Barcelona, the location of our case study. The third example, House of One, signifies the future, as it is a yet-to-be-constructed building that has sparked considerable debate about the nature of future multireligious spaces.

On a conceptual level, all three examples share common formal concepts that are worth highlighting and considering when designing such buildings. Firstly, the formalization of space using circular, elliptical, and concave shapes creates an environment that embraces and gathers the user. Secondly, the control of lighting and shadows creates an atmosphere of reflection and silence. Additionally, these buildings utilize materials in a way that the materials themselves serve as the primary ornamentation of the space, rendering additional decorative elements almost unnecessary. In relation to this point, while seemingly contradictory yet complementary, the present ornamentation is deliberately sculptural, focused, and material-based. Finally, all three examples emphasize verticality as the predominant spatial axis, which contrasts with and complements the horizontality of the ground plane.

On a vocational level, the authors of the three projects emphasize spirituality over religion when describing their work, a factor that contributes to the success of such buildings.

For all these reasons, among the many multireligious buildings constructed and unconstructed worldwide, these three have been chosen to accompany and justify the design decisions made in the case study of the Silent Space at the PCCB of SJD Hospital.

2.2.1. Paradigmatic Example from the Past: MIT Chapel

The first successful multireligious chapel of reference (because there were earlier examples that did not succeed and even failed) is the Interfaith Chapel designed by Eero Saarinen, built on the Massachusetts Institute of Technology (MIT) campus in 1955 (Figures 3 and 4). According to contemporary chronicles collected in Jeanne Halgren Kilde's latest article (Kilde 2024), its success is due to the unique conviction that the most important aspect of "religion" was not identification with a particular tradition or engagement in a particular worship practice, but the widely shared human experience of "spirituality".

Figure 3. MIT Chapel. Interior photo. Altar and skylight decorated with metal sculpture by Harry Bertoia. Massachusetts Institute of Technology. Lorianne DiSabato, 2014. (https://www.flickr.com/photos/zenmama/14481975953 consulted on 28 June 2024).

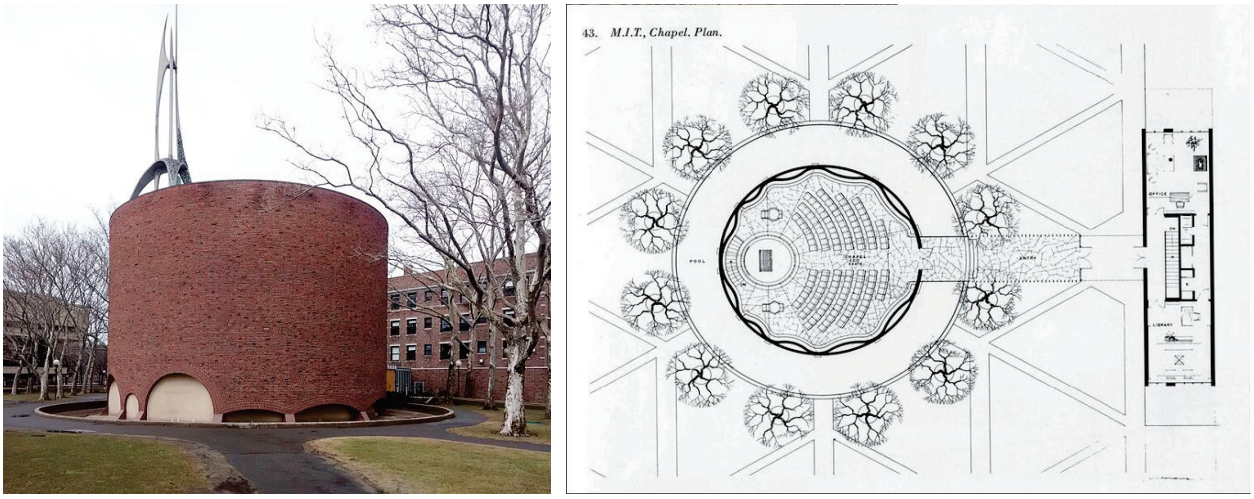

Figure 4. MIT Chapel. Left: exterior photography (Photo courtesy Gunnar Klack, 2014, CC BY-SA 4.0 via Wikimedia Commons); right: ground floor drawing (Hic et Nunc 2023).

To put the reader in context, in the 1950s, the US national ethic, heavily influenced by the Cold War and opposition to communism, prompted MIT leaders to consider building a chapel, thus reflecting a commitment to non-materialistic values. The predominantly secular and scientific institution actively participated in the war effort during World War II and became a significant defense contractor (Leslie 1993). To counterbalance this and address incidents such as the arrest of a former student for espionage and academic controversies, they saw the need to also attend to the moral and religious development of students (Giraud 2014; Buckley 1951).

The Dean of Students at the time, Everett Moore Baker, advocated for a personal approach to religion and the creation of a space for religious reflection, promoting an inclusive understanding of faith that aligned with science (Baker 1951). This approach sought to offer a counterbalance to the materialistic image of MIT, adapting to the emerging religious and ethical sensibilities in a context of secularization and pluralism. The chapel proposal reflected a progressive vision of religion as a compatible and enriching element of scientific education, evidenced by an international conference at MIT highlighting interest in the social implications of scientific progress and the relationship between science and faith, attracting a large audience (Burchard 1950). This shift towards a more inclusive understanding of religious life marked an effort by the institution to address the ethical and spiritual concerns of its community at a time when national narratives emphasized religion as an antidote to communism.

Eero Saarinen's innovative approach to designing the MIT Chapel reflected this conceptual shift towards a universal understanding of religious experience, moving away from traditional divisions among different religious practices. This shift was articulated through the chapel's design as a space intended for individual experience of transcendence, beyond sectarian differences, which was a novel idea at the time (Saarinen Challenges the Rectangle 1953).

Saarinen's description of the design reflected a deep contemplation on how the physical environment of the chapel could evoke a state of spiritual reflection, inspired by personal experiences capturing the essence of transcendence and immanence (Smith 1962). The resulting design emphasized elements that invite introspection and contemplation, such as the dim lighting suggesting a "sacred and enclosed darkness" (Thomas 1954) and architectural elements resonating with both life and death, symbolized by the building's cylindrical shape and its exterior blind arches.

The chapel's integration into campus life and its acceptance as a personal reflection space for individuals of all beliefs is as evidenced by the diversity of religious services and meditation activities it hosted after its opening. The space's management reflected this inclusive philosophy, offering services for a wide range of religious traditions and dedicated times for private meditation, highlighting the success of Saarinen's design in facilitating a multireligious and multifunctional space (Killian 1985).

This focus on individual personal and spiritual experience rather than group worship practices marked a significant shift in the conception of religious spaces, allowing the MIT Chapel to serve as a model for future architectural developments in multireligious spaces, both in academic and public settings.

2.2.2. Example of the Present from Barcelona: Patriarch Abraham

Another noteworthy example, being the first of many, is the multireligious temple constructed for the first time for the celebration of the Olympic Games (Arboix-Alió 2016). In Barcelona, in 1992, it was unprecedented for such a sporting event to decide on building a structure that allowed various religious practices for athletes from around the world participating in the Olympics (Figures 5 and 6).

Figure 5. Patriarch Abraham. Left: exterior photography; right: interior photography. The authors, 2015.

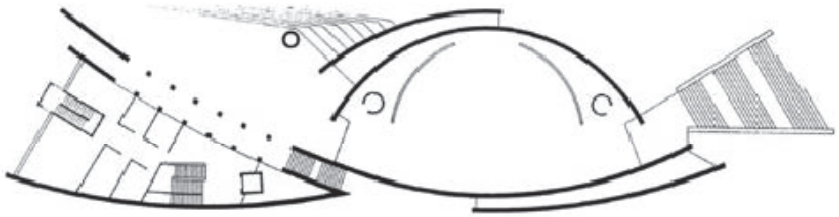

Figure 6. Patriarch Abraham. Ground floor redrawn by the authors.

It is a sculptural building with a unique vocation that takes the dedication of Abraham, the common patriarch of the three major monotheistic religions of the Christian confessions (Christianity, Islam, and Judaism). After the games, it transitioned to a parish of the new neighborhood. While this might seem like a failure, this adaptability speaks to the success and flexibility of the proposal. In reality, many cited multireligious spaces start as spaces for one religion and transform into spaces for multiple religions, and vice versa: spaces initially designed to accommodate religious diversity for a specific event transition to serving the religious community that remains in that place.

The building, designed by architects Josep Benedito and Agustí Mateos, has evident and reiterated symbolism. The shape of the complex is that of a large fish, recalling the maritime memory of the area and alluding to the ancient Christian symbol representing Jesus. The temple itself is located in the "body" part, elliptically shaped, with the "tail" for parish dependencies, which today is practically empty due to its oversized dimensions. The worship space is illuminated by glassed-in accesses and the ceiling, covered by beams and wooden ribs arranged as if it were the belly of a ship. The main access is through a grand staircase and an atrium, leading to the entrance porch under the church choir. The floor plan is symmetrical, with another more frequented access on a higher street level (Arboix-Alió 2018).

However, beyond the church itself, this is a paradigmatic case of how a church and a city are built simultaneously, with the former being the unique building marking a new neighborhood and a new urban fragment (Arboix-Alió et al. 2023). The project on paper and the church's construction with the urban fragment go hand in hand in this case, as a result of a special event, the celebration of the Olympic Games. This social and multitudinous celebration drives the urbanization of an entire city sector, with the sacred

building as its distinguishing feature. In commemoration of the sporting event, and to host athletes, technical teams, and their families who moved to Barcelona, the Olympic Village neighborhood was constructed, and the Patriarch Abraham temple was built as a symbolic monument. The city sported a complex design and subsequent transformation into a residential neighborhood, undertaken by the team of Josep Mª Martorell, Oriol Bohigas, David Mackay, and Albert Puigdomènech, incorporating projects from architects and urban planners who have won FAD awards.

2.2.3. Future Example: First Multireligious Center in the World: House of One

As Tom Wilkinson explains, "Berlin has an unhappy history when it comes to accommodating non-Christian religions, and the rest of Europe is treating synagogues and mosques in a way that balefully echoes this past. So, what better place to set an example of a more positive interaction between adherents of different faiths than on the site of a church that was burnt by the SS and demolished following the Second World War—and which, itself, stood on the site of Berlin's first medieval church?" (Wilkinson 2016).

The idea of replacing it with a more inclusive facility was first conceived by the church authorities in 2008; Kühn Malvezzi won an international design competition in 2012. The projected building consists of three separate spaces grouped around a towering central volume, which permits "unity in diversity": the Jewish element is a lozenge, the Islamic element square, and the Christian rectangular. The first two are equipped with galleries to permit gender segregation; the Islamic space has ablution facilities; and the Christian space has an organ. Rather than simply expressing a hope that proximity will breed amity, the central zone will be used to host events that encourage interaction. Funds are being raised to begin construction. Still today, then, religion has an important place in defining the image of cities (Deibl 2020).

To realize this project, EUR 43.5 million are needed, and anyone can contribute, even by buying a single brick online for EUR 10. This type of collective sponsorship, similar to other projects funded through crowdfunding, finds its similarities precisely in expiatory temples, where believers paid money to be absolved of their sins and contribute to the temple's construction and maintenance. It is, in reality, a unique experiment in the world. We are talking about a worship building—church, synagogue, mosque—where Christians, Jews, and Muslims can pray in Berlin. They agreed that construction would begin once the first EUR 10 million were raised. Thanks to the success of individual donations and sponsors' support, the foundation stone ceremony could be held in 2021. It took place at Petriplatz, in the southern part of the Museum Island, where the medieval settlement of Cölln developed, eventually joined to Berlin in the 18th century. The building has been named "The House of One", implying that it will be the house of humanity, not just those who believe in one God. The international competition was won two years ago by an architectural firm founded by Germans Wilfried and Johannes Kühn and Italian Simona Malvezzi. They designed this brick cube dominated by a tower, whose structure satisfies and certainly was not easy to reconcile the different needs of assembly and prayer of the faithful of three different religious confessions (Figures 7 and 8). It is a "peace project", therefore, whose idea first emerged in 2009 by a Berlin evangelical pastor, Gregor Hohberg. Today, his two adventure companions are liberal rabbi Tovia Ben-Chorin from Abraham-Geiger-Kolleg, and imam Kadir Sanci, belonging to a Turkish organization in Germany, the Forum for Intercultural Dialogue, which refers to preacher Fethullah Gülen, a major opponent of Ankara's head of government, Tayyip Erdogan. Hohberg recounted that a few years ago, while archaeological excavations at Petriplatz unearthed fragments of a distant past, including remains of five churches (one dating back to 1200), it seemed the right place to do something "visionary", looking towards the future, inspired by brotherhood, dialogue, and mutual respect.

Figure 7. HOUSE OF ONE. Ground floor redrawn by the authors and concept elevation (https://www.dezeen.com/2015/11/03/house-of-one consulted on 23 June 2024).

Figure 8. Exterior photography of the PCCB building, PINEARQ Courtesy (PINEARQ 2023).

However, even the world's first multireligious center ultimately proposes separating spaces according to confessions. Is it not an intelligent way to combat aseptic spaces while minimizing construction and maintenance costs?

In any case, our project goal has been to take everything that seems to work correctly in the cited three interreligious chapels and apply it to a space within the PCCB at the SJD Hospital. Thus, despite not constructing an isolated building nor exclusively a sacred building, because our Multireligious Space is placed within the interior of a hospital, we aim to demonstrate that quality design is possible. This approach could be extrapolated to any other public or private building of public concurrence that needs to offer a space for reflection linked to individual spirituality, moving away from the aseptic rooms proliferating everywhere in recent decades (Sitte 1980). From now on, thanks to the Multifaith Room at

PCCB at HSJD, hospitals, airports, shopping centers, schools, and universities have another contemporary example to inspire and hopefully improve, contributing to strengthening ties between research and applied research.

2.3. Design of the Multireligious Space at PCCB of SJD Hospital

2.3.1. What Is the PCCB?

The Pediatric Cancer Center of Barcelona is a center focused on pediatric cancer within the Sant Joan de Déu Hospital in Barcelona (SJD). AM, the center's care director, in an unplanned conversation, defined it as a starting point for an international network of centers specializing in the cure, care, and research of cancer in children. It is a pioneering center in Europe, based on four objectives: (1) increasing cancer cure capacity by offering comprehensive and personalized care, (2) achieving new effective treatments for currently incurable cancers, (3) reducing the sequelae of surviving children, and (4) being an open-to-the-world center with a service vocation. This is defined in its strategic plan explained below. The need to create a specialized pediatric center becomes evident due to the 47% growth of new children treated between 2017 and 2022 according to the center's data. In fact, they estimate a 40% growth rate in recent years. This rate has a higher increase due to international admissions, 35%, a key aspect for the project presented in this article. The more international patients with diverse religions we have, the greater the need for a welcoming multireligious space to support families through the difficult times of illness or the death of young children.

Regarding the city, the PCCB is located northeast of the city, bordered by the Collserola natural park, an interstice between the city and nature (Figures 8–10).

Figure 9. Ground floor of the PCCB building. The red circle indicates the location of the Multifaith Room. The authors.

Figure 10. Orthophoto of the Metropolitan Area of Barcelona. The city, easily recognizable by its urban layout and its location between two rivers to the northeast and southwest, and between the sea and the mountains to the northwest and southeast. The red dot indicates the location of the PCCB-SJD Hospital. The authors.

2.3.2. Functional Plan of PCCB

The functional plan of the project is structured on the generic model of user-centered design (Mao et al. 2005) and a specific approach of the 4Ps: Play, Parents, Pain-free, Professionals. These outline the incorporation of gamification in processes, constant engagements with companions and family members, humanities as a pillar of the atmosphere, and constant involvement of professionals. It is a functional plan resulting from a co-design process, with a social impact viewpoint (Hospitecnia 2022), in which different user groups inhabiting the hospital and its surroundings participated.

The result of this process proposes the rehabilitation of the old teaching building and the incorporation of a new building, which will allocate 70% of its space to healthcare facilities and the remaining 30% to research and development. The new center has 37 single rooms, 8 transplant rooms, 26 day hospital boxes, and 21 outpatient consultations. It also houses a Nuclear Medicine and Metabolic Therapy service; operating rooms; oncology research laboratories; and other healthcare services (Hospitecnia 2022). There is also a set of social spaces, promoting shared knowledge among all involved in the project, such as playrooms, hospitality environments, and "Family Lounges".

The PCCB opened its doors in June 2022 and is currently implementing its 2023–2027 strategic plan. This plan emphasizes the hospital network and internationalization. This internationalization consequently requires multiculturalism to be addressed from a humanistic and care perspective proposed by its values. From the relational knowledge of the participative context of the families, the need arose for a space for meditation and reflection for families, companions, and all those who need it, whether from the hospital community or the city, a 24/7 public access space. This space will become a multireligious space in a hospital of the Christian Order of Saint John of God, co-

existing with the existing chapel in the Hospitalization building designed by Clotet Llongueras Architects.

2.3.3. Design of the Multireligious Space at PCCB

Under the title "Silent Space", this multireligious space was proposed in the fourth month of 2023, as a result of the aforementioned precedents and on the initiative of the SJD infrastructure department, led by Albert Bota and its Managing Director Manel del Castillo.

The starting point is for the architecture and design team, OVICUO, and two members of the Design Research Group from the University of Barcelona—the authors of the current article—to develop a proposal for a multifaith and non-religious public space for the PCCB (Figures 11 and 12).

- Culture as a Habit

This entails understanding culture as something beyond knowledge, seen as something learned, repeated, and transferred. Thus, the habit of meditation opens the service to people who may require it. If meditation becomes a habit, it can be considered a salutogenic service for the community. Habit as an element of repetition and sequence as a ritual. A set of actions repeated sequentially to achieve a result. The word Ritual etymologically comes from the Latin "ritualis", belonging to the rite. In Roman usage, in legal and religious terms, "ritus" was the proven way of doing something, generating habit. Some authors show clear concern about their disappearance and homogenization (Han 2020).

To carry out a ritual of habit that generates culture, a place is necessary. The space must become a non-place of the public, a space that must be appropriated by the people who use it, a neutral space that allows for adaptation by its users, and a minimal space isolated from interferences. The fewer interpretable symbolic features, the greater the possibility of adaptation. The Silent Space should be a simplified environment of connection with everything, as Harman explains in his book on the quadruple object, an ontological relationship between objects, understood here as agents (Harman 2016).

Based on the examples and bibliographic references presented, the proposed project is based on the following guiding concepts.

- The Relationship between the Tangible/Intangible and Nature/Mathematics

To establish this ontological connection between the physical and the non-physical, the space is based on axes (Figure 13). The vertical axis seeks to unite the tangible and intangible, materialized by a warm circular zenithal light creating a weightless atmosphere. The horizontal axis finds its place in an architectural plan responding to a golden rectangle that the user cannot directly perceive but harmonizes the space proportions. Both axes converge as the space limits generate a spiral culminating in an empty center where the user is placed. Additionally, if the plan proportions relate to the golden number, the vertical proportions relate to those proposed by Le Corbusier in "Le Modulor", a set of proportions related to the human. Thus, nature and human, tangible and intangible, juxtapose like a fabric. "On the basis of the size of the statistical median of human size, Le Corbusier determined a series of measurements, meant to define the proportions of building components, of entire structures, as well as of graphic layouts" (Cohen 2014). Symbolically, it presents the constant relationship between nature and artifice, evidently being a designed and artificial space (Aicher 1994). Nature is expressed through the natural wood perimeter and natural cut sandstone on three sides, situated in the center horizontal space.

Figure 11. Photography of the interior of the recently inaugurated Silent Space, 2024. The authors.

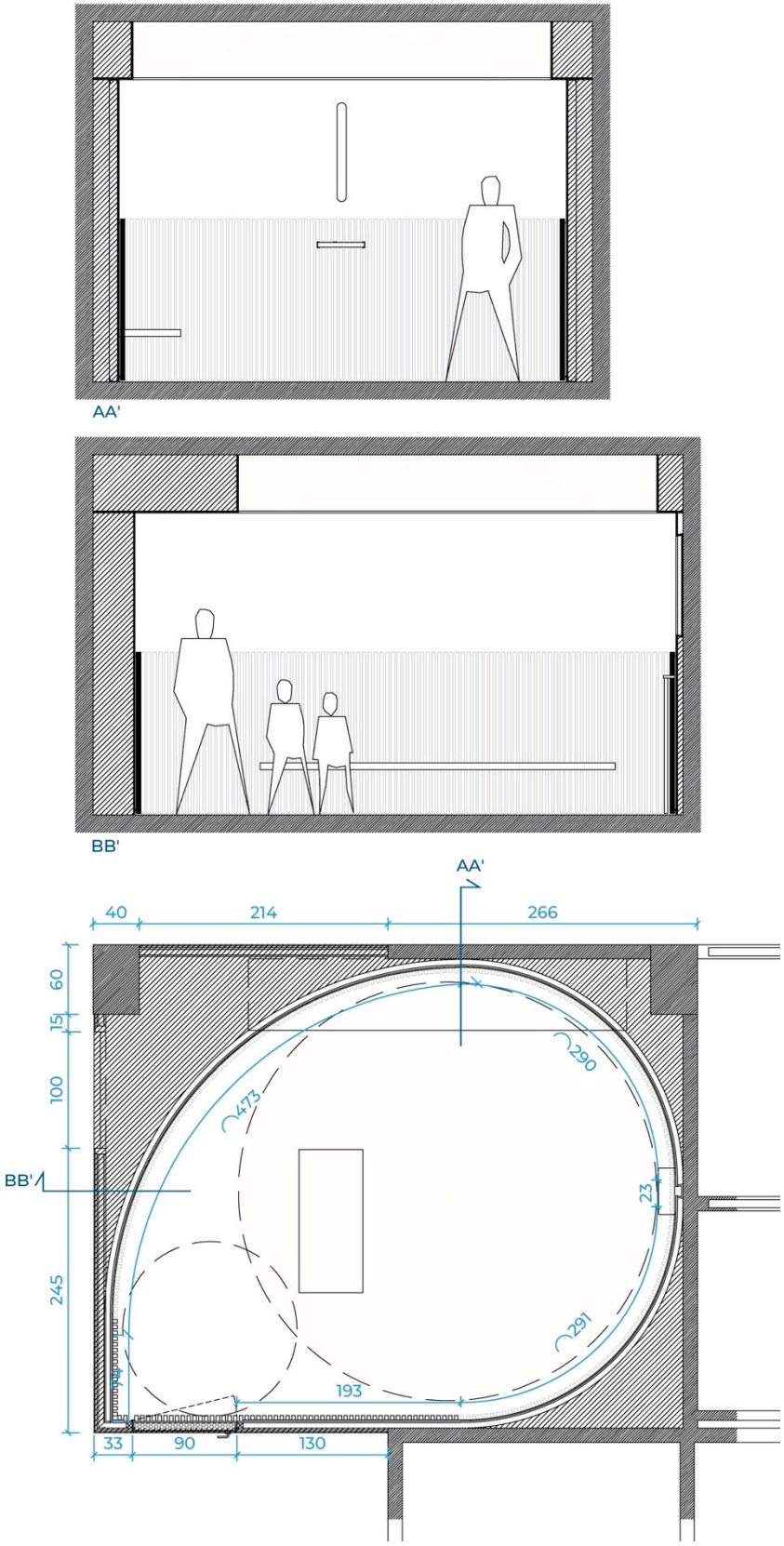

Figure 12. Silent Space floor plan and sections (units in centimeters). CAD documentation provided by OVICUO.

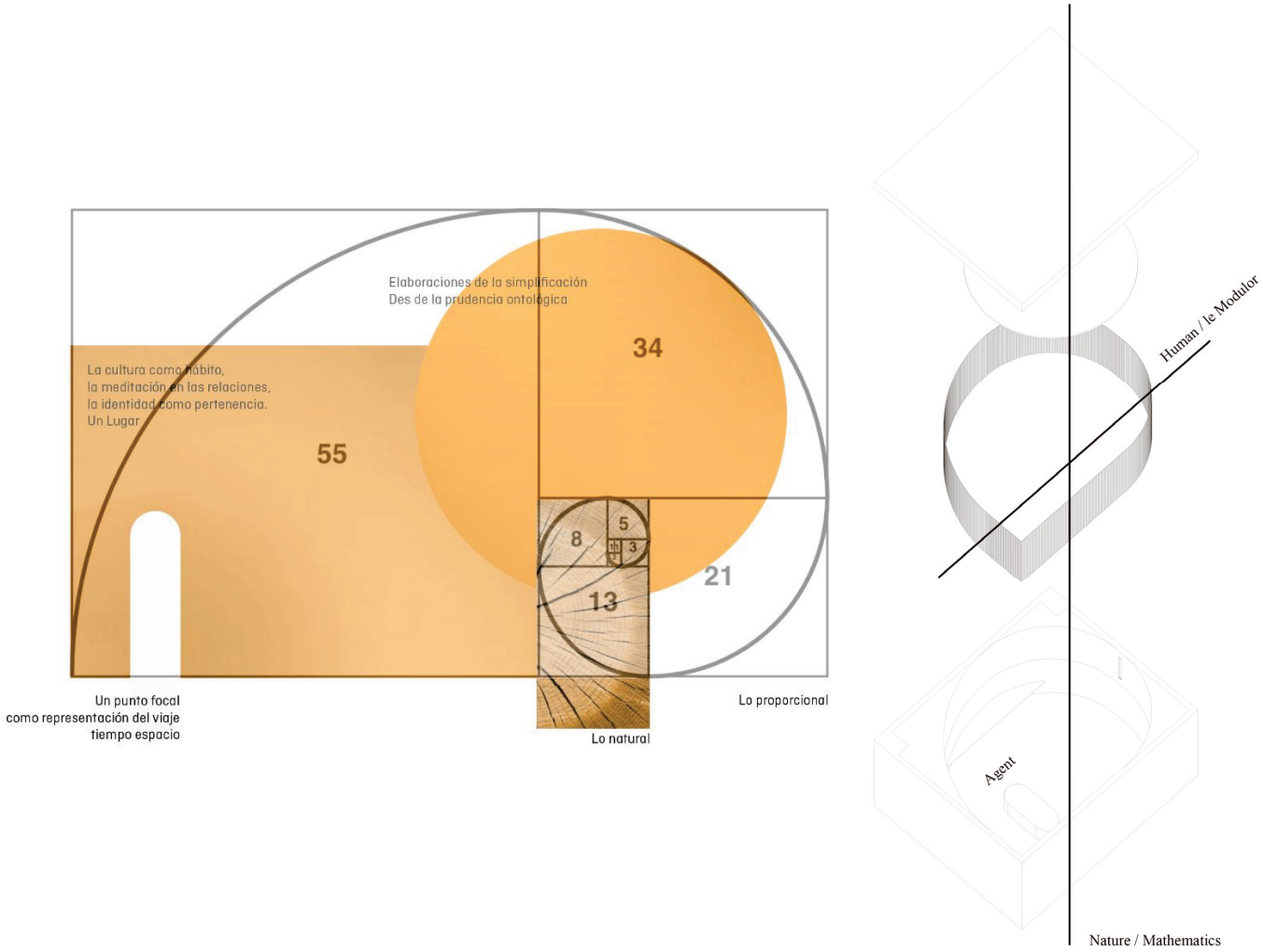

Figure 13. Conceptual drawings of the projected multireligious space. The authors.

- Attention to Lighting

Lighting plays a fundamental role in this project, as seen in the project image. There are three types of lights perfectly designed to give the atmosphere the space needs: the focal point, the horizon, and the zenith. The focal point is an illuminated vertical shaft allowing for an infinite focal point. The horizon appears as a continuous line embracing the user. Finally, on the zenith plane, a soft light appears as if an oculus were in the upper plane. The scenic solutions are adaptable to each user and combinable with each other.

The space provides isolation for the person to focus on their meditation. Once inside, the space's continuity is constant, integrating the exit to some extent. The lighting adapts in terms of intensity and acoustics with different melodies specifically composed by SJD under the title "Sons del Silenci" (in Catalan meaning Sounds of Silence). Temperature, light, smell, and acoustics relate to generating the particular weightless atmosphere of the Silent Space. Additionally, without detailing further, as it is not the study's objective to delve more into the project process, some parameters worked by Zumthor (Zumthor 2006) were used in creating the atmosphere.

The construction of the multireligious space began on 13 December 2023, with the conditioning of a pre-existing office and the use of part of the common area in the building's access lobby (Figure 14). The construction period took three months, with the faculty team conducting weekly site visits alongside the working teams and the property. The Silent Space organically opened to the public on 1 March 2024, becoming a community service space that is open and accessible to the public, a "non-place" for community connection

and a public space. It aims to provide a warm and welcoming environment, contrasting with the minimalist white room previously offered and currently maintained.

Figure 14. Collage of the work in progress and inauguration of the Multifaith Room of the PCCB-SJD Hospital, the Silent Space. The authors.

At this point in the article, we advocate for designing new multireligious spaces in hospitals, airports, schools, universities, and shopping centers with this sensitivity, drawing from the best examples. The recently inaugurated multireligious chapel at PCCB of SJD serves as an example of this approach and helps us avoid cold, white, and impersonal rooms. These rooms, under the argument of not wanting to symbolize any particular religion to include all of them, actually fail to address the design of a space that should offer retreat, peace, and reflection to any user in need (Figure 15).

Figure 15. Comparison of the interiors of the 4 analyzed multireligious spaces: the 3 paradigmatic examples of the past, present, and future, and our recently constructed case study. The authors.

2.4. Limitations and Future Perspectives

SJD Hospital now has two multireligious spaces: the recently inaugurated study object room designed following the explained parameters and the cold minimalist white room. A future research direction would be to conduct a statistical study to quantitatively measure the time and intensity of use of each space, as well as a sociological and ethnographic study to qualitatively assess user satisfaction and comfort in each space.

Another limitation of this study would be the need to visit the reference examples to broaden the theoretical knowledge of these spaces beyond paper consultation and bibliographic search, incorporating a lived experience of the projected atmospheres.

3. Materials and Methods: Methodology

The methodology undertaken for the research is primarily based on three pillars: a literature review, an analysis of architectural design projects structured along a temporal axis, and a series of in-depth interviews. These processes are complemented by the project methodology inherent to design, which is based on a systematic structure proposed by Professor Bruce Archer (Archer).

This methodology adapts to the particular context of spatial design, understanding space as an object of interaction with people. Archer's sequential scheme has been carried out in the form of a black box (Jones 1978). Jones differentiates between a transparent box and a black box in relation to the uncertainty present in design decision-making, where context and time play a modifying role. Consequently, the same project will undoubtedly yield different results over time. Archer advocates for a structured follow-up of the project without the necessity of presenting results in a fragmented manner.

Archer proposes the following systematic structure and its iterations:

1. Problem definition.
2. Data collection.
3. Analysis and synthesis of the data to prepare design proposals.
4. Prototype development.

5. Preparation of studies and experiments to validate the design.
6. Preparation of production documents.

In this case, due to budgetary and scale constraints, it was not possible to develop physical prototypes, but five visual prototypes were created. Experimental studies based on these prototypes were conducted to validate the model to be implemented. An example of this is the iteration in the decision-making process for the bench, initially proposed in wood and later incorporating natural cut stone.

Regarding the research methods, the literature review consulted is shared in this article and serves to develop an analysis of the contextual and theoretical framework. The analysis of architectural projects structured along a temporal axis (past–present–future: (a) the first documented multi-religious hall project, (b) a contemporary and notable project in the city of Barcelona, and (c) a proposed project for the near future) allowed for the extraction of essential typological characteristics (Moneo 1978) of multi-religious spaces: natural lighting, vertical focal point, horizontal focal point, nature, and artifice. Therefore, the set of essential characteristics and their combination are applied to the project (Martí i Font 1999). The typological grouping and combination of types is one of the introductory methodologies to design research (Figure 16).

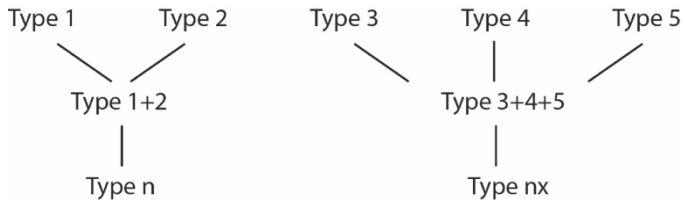

Figure 16. Scheme of types, combination of types, and subtypes. The authors.

To determine the exact needs of the multi-religious space, data were collected through conversations, also considered knowledge generators (Mengis and Eppler 2008). Social conversations with families, companions, and professionals were facilitated by the General Director of Infrastructure, a consistent relational profile in the development of the research. Additionally, scheduled interviews were conducted with JBC, a brother of the Order of Sant Joan de Déu and representative of the Curia, and the chaplain of SJD responsible for organizing Christian ceremonies, Brother MM. These interviews emphasized the value of inclusion and respect for multiculturalism, a principle that the future Silent Space in the PCCB must undoubtedly uphold. These interviews also suggested the possibility of adding a focal point in the form of a shelf to place various symbolic objects, such as a cross for Christian users. In phase 5 (preparation of studies and experiments to validate the design) of the sequential method proposed by Archer (Archer), the project is shared with the Medical Director and the General Director of SJD.

The methodology of ethnographic conversation will help the researchers to follow up on the project and the users' perception of the space. This methodology also helps plan the future monitoring of the project. In this regard, once the silent room was inaugurated, feedback was collected from the purchasing director of SJD and some of the suppliers who visited the space privately and individually after the work was completed. As an observation, the researchers will visit the space periodically during the first year of use to detect possible implementable iterations. It is expected that in the future, interactions with a diverse range of users will be possible, allowing for a detailed study of the evolution of the proposal.

The combination of the literature review, temporal analysis, in-depth interviews, and systematic design methodology provides a robust framework for researching and designing multi-religious spaces. This approach ensures that the design is informed by historical context, contemporary practices, stakeholder needs, and validated through experimental studies, ultimately leading to a well-rounded and inclusive design solution

4. Conclusions

The integration of a multifaith room within the Pediatric Cancer Center Barcelona (PCCB) at Sant Joan de Déu Hospital represents a significant advancement in the design and utilization of hospital spaces. This initiative aligns with contemporary trends emphasizing the importance of creating inclusive, spiritually accommodating environments in healthcare settings. Through this study, we have detailed the research, design process, and implementation of this pioneering space, highlighting its innovative approach and relevance.

The PCCB serves a diverse international patient population, underscoring the necessity for a space that accommodates various religious and spiritual needs. Traditional hospital chapels often cater to a single religious denomination or, at most, multiple Christian denominations. By contrast, the multifaith room at PCCB breaks new ground by welcoming individuals of all faiths and those without religious affiliation, offering a sanctuary for meditation and reflection. This inclusivity not only meets the spiritual needs of a diverse patient base but also aligns with broader societal shifts towards greater acceptance and understanding of multiculturalism.

The design of the multifaith room draws from historical and contemporary examples, such as the MIT Chapel, Patriarca Abraham, and the House of One. These spaces share common design elements, including the use of circular, elliptical, and concave forms that foster an embracing and contemplative environment. The careful manipulation of light and shadow enhances the room's atmosphere, creating a tranquil and introspective space. Material choices serve as inherent ornamentation, reducing the need for additional decorative elements and emphasizing the space's simplicity and purity.

The design incorporates philosophical insights from thinkers like Heidegger and Harman, too. By considering both the ontological relationships between objects and the holistic interconnectivity of all elements, the multifaith room embodies a space where the tangible and intangible, nature and human artifice, converge harmoniously. This approach not only respects the diverse spiritual practices of its users but also elevates the space beyond mere functionality to a profound expression of universal spirituality.

It also represents Heidegger's fourfold: earth, sky, gods, mortals (Harman 2016, p. 89). This is almost literally true with the stone, skylight, place to sit, and the spiritual atmosphere. In the spirit of Object-Oriented Ontology, objects such as this space do not just respond to a brief in a passive way but interact with users in ways that are quite unpredictable, as if the space possesses a life and intentions of its own.

The construction of the multifaith room within a hospital setting, particularly one managed by a religious order, demonstrates a progressive commitment to meeting contemporary spiritual needs. The collaborative efforts between the design team and hospital administration ensured that the space would be both functional and welcoming. This project exemplifies how thoughtful design can transform hospital environments, contributing to the overall well-being of patients and their families during challenging times.

Moreover, the inclusion of this space in the PCCB highlights the hospital's dedication to holistic care. By addressing not only the physical but also the emotional and spiritual needs of patients and their families, the hospital reinforces its role as a leader in pediatric healthcare. This approach aligns with current healthcare trends that emphasize patient-centered care, recognizing the importance of supporting all aspects of a patient's experience.

The establishment of the multifaith room sets a precedent for future developments in hospital design. It serves as a model for other institutions seeking to create inclusive and spiritually supportive environments. Future research could involve longitudinal studies to assess the impact of such spaces on patient and family well-being, providing empirical evidence to support the continued evolution of hospital design.

In conclusion, the multifaith room at the Pediatric Cancer Center Barcelona represents a forward-thinking approach to hospital design. It addresses the spiritual needs of a diverse patient population, integrates philosophical and architectural insights, and exemplifies the potential for healthcare spaces to contribute positively to patient care. This project not only

enhances the PCCB's reputation as a leading medical institution but also offers valuable lessons for the broader field of healthcare design. The triad of "religion", "public space", and "society" makes more sense here than ever before.

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