

# **The Sonic Characteristics of Early Christian and Byzantine Liturgical Architecture and Worship**

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## Introduction

Fundamentally, this paper will investigate the sonic and aural characteristics of early Christianity and Byzantium through research into the development of liturgical architecture and liturgy as a theological and ecclesiastical practice. This paper will focus on the heightened awareness of sonic characteristics from the early beginnings of Christianity through to late Byzantium; allowing for not only historical discussion but also investigation into socio-political, geographical and technological factors concerning the expansion of Christianity as a faith and therefore the development of liturgical practice and religious architectural form. Despite the seemingly important role of sound in liturgical practice and religious experience, much academic writing that is concerned with Early Christian and Byzantine churches chooses to focus on the visual and decorative elements, leaving to interpretation the true influence that sound holds over these spaces. This paper will discuss these relationships by examining the impact of sound on liturgical practice, religious thought and architectural advancement as well as investigating the interrelations between technological advancements, architectural developments and the role of sound which all contributed to the concept of a heightened sonic awareness.

The objectives of this research are rooted in finding an intrinsic connection between aural or sonic characteristics and the liturgical environment of Early Christianity. These objectives are examined throughout the course of three chapters. The first chapter investigates the development of liturgical architecture in relation to sound and aural architecture, the second chapter aims to investigate the impact of sonic effects on this heightened sonic awareness which lead to change and development in early Christian liturgical architecture and sound as a liturgical device, and the final chapter outlines historical lineages and contexts that allow for this relationship between sound and liturgy to be situated in a place that is both familiar but curious to the reader: leading to modern worship, as both a concept and religious practice, being informed by sound whether it be a communication device to the divine or as a product of the aural architecture that it exists within and these concepts can be traced back to far beyond antiquity.

This research focuses primarily on early Christianity through to late Byzantium, with an important emphasis on architectural and liturgical developments. Whilst the paper will reference other liturgical architectural forms (for example, Judaic temples and Greco-Roman structures that later set

the foundation for early Christian basilicas), it does not seek to investigate these additional forms thoroughly and instead chooses to use early Christian and late Byzantine liturgical architecture, whether Catholic or Eastern Orthodox, in order to illustrate its point about the specific, given historical period. This paper cites a vast range of research and a variety of sources such as scientific, theological and architectural in order to form diverse and heterogeneous arguments. For example, ‘Soundscapes of Byzantium’ (Antonopolous, *et al.* 2017) is a crucial scientific work that helps to bridge the gap between scientific analysis of Byzantine architecture and the spiritual impact of these architectural features on liturgy as an evolving practice. Another important text that this research is inspired and informed by is Jeanne Kilde’s ‘Sacred Power, Sacred Space’ (2008) which is a book that investigates, in depth, the relationship between Christian architecture and worship through a comprehensive understanding of church architecture as an influence on Christianity as a faith.

## Chapter 1

This chapter is concerned with the changing in architectural form of early Christian and Byzantine churches, particularly the transition from timber-roofed, longitudinal basilicas often associated with early Christianity to centrally-planned cathedrals, typically smaller in size, which began to become more prominent throughout late antiquity due to Justinian’s ascent to the throne of East Rome in 527 and his ‘divine mission to re-establish orthodoxy and to guide the Church throughout his dominions and beyond’ (Krautheimer, 1986, p.211). The changing architecture had a profound impact on the way in which liturgy and liturgical compositions were performed and churches were described as ‘the locus of this cosmic intermingling’ (Antonopoulos, *et al.* 2017), ‘cosmic intermingling’ implying a relationship, a concelebration, between human and the divine; heaven and earth. This chapter will begin to deconstruct the reasons for and ramifications of these changes in architectural form throughout the early Christian and Byzantine period, particularly in relation to liturgical spaces such as churches and cathedrals, by investigating the development of Christianity into a legally recognised religion as well as its later divergence into different geographically-defined entities due to a combination of socio-political and theological factors. It will then begin to discuss the process of technological advancement as a defining moment where liturgical spaces and their architectural forms were encouraged to develop, leading to vast changes in liturgy as a practice whilst considering the role of sound within these advancements.

Understanding the role of worship, liturgy and the Christian faith, within the Church as well as within a broader spiritual context, is fundamental to comprehending the synchronous development between the role of liturgy and changing in architectural form of physical churches. There is a clear link between the progression of Christianity as a practised faith and the evolution in the function of a church or religious space, which meant for development in religious architecture.

In the first few centuries of Christianity, churches were not built for a variety of reasons; Christianity was not a legally recognised religion amongst Europe and the Roman Empire and therefore faced oppression, which in turn meant that Christians could only conduct worship in 'private houses' (Walker, 1985, p.475). This method of liturgy made for interesting sonic characteristics, it was the beginning of the idea of 'collective singing' and 'chanting'. These intimate spaces where these verses were performed allowed for a more collective and community type of worship that valued the human voice and acoustic intimacy; the concept that is carried on up until and through the construction of proper, public spaces of worship, particularly longitudinal basilicas. Whilst there is acknowledgment of the introduction of 'communal' worship in these spaces, it is important to differentiate between this style of communal worship which is due to the rapid growth of Christianity prior to its recognition as a legal religion and the later re-introduction of communal worship in conjunction with the introduction and expansion of later centrally-planned churches. Floyd V. Filson (1939, p.106) explains how 'as the [Jerusalem Church] grew in size, it became increasingly difficult for all believers in the city to meet in one house'; an issue that is later rectified by the introduction of bigger, particularly centrally-planned structures.

As Christianity developed as a faith and a religion, differences between 'eastern' and 'western' perspectives began to arise regarding theological ideas. The most crucial date to note regarding this divergence is 'the Great Schism' (or 'the East-West Schism') of 1054. This event was a break of communion between the Catholic Church (the 'western' perspective) and the East Orthodox Church (the 'eastern' perspective). 'Eastern' or 'orthodox' perspectives expanded further east from Greece and present-day Turkey and maintained 'architectural and spatial legacy of early Byzantine churches' (Kilde, 2008, p.59), a characteristic that is underlined by traditional orthodox worship ritual; people would value individualistic worship less and would put more focus on community. This division gave Orthodox Christians more freedom to construct more centrally-planned churches in order to be able to achieve this 'cosmic intermingling' between heaven and earth; sound would travel upwards, from floor to top of the dome, and back downwards as though voices were

emanating from heaven or angels. Aside from liturgical practice, a centrally-planned church allowed people to congregate easier in order to communicate with God as a community. It can be perceived that orthodox perspective placed more value on the idea of sound as a communicative device when it came to constructing religious space, or 'powerful space' (Kilde, 2008, p.4). Alternatively, the 'western' perspective continued to focus on a style of liturgy that emphasised individual spirituality through monastic practice. Western tradition continued to utilise basilica style churches which complemented monastic practice much more.

The Byzantine Empire's theological and political conflicts significantly influenced the change in architectural form of liturgical spaces. A shift in architectural trend between smaller basilicas and centrally-planned structures conveniently outlines the growth of Christianity as a far-reaching and wide-spreading religion that would continue to branch off into different socio-political and religious ideologies and beliefs.

Centrally-planned churches, characterised by their central dome, embodied this idea of 'cosmic harmony', where heaven and earth meet. According to art historian Richard Krautheimer (1986, p.215), 'the central plan became the architectural manifestation of the heavenly sphere, Symbolising the unity and centrality of the divine' as it allowed worshippers to gather around a single point, representing the omnipresence of God and the unity of the Church. This design was popular during times of conflict, as it conveyed a visual message of harmony and theological cohesion throughout the Byzantine Empire. Additionally, Justinian's ambition to consolidate power and further orthodox Christianity as the empire's guiding force was symbolised through monumental centrally-planned churches like the Hagia Sophia. John Lowden (1914) describes how such structures 'projected both the emperor's power and the spiritual unity of his empire', merging political and religious ideas into architectural form. Therefore, the conflicts and theological debates within the Byzantine Empire directly impacted the rise of centrally-planned churches, using architecture as a medium for spiritual and political unity.

Another way in which the changing architecture of Early Christian and Byzantine churches impacted liturgy and liturgical practice was through technological advancements at the time, specifically regarding acoustics and design. These advancements were paramount in the shaping of liturgy in the Christian faith. Church architecture began to move from longitudinal basilica-style buildings towards physically bigger centrally-planned structures due to the introduction and

development of new forms such as arches and domes. Of course these developments had a massive impact on the acoustics of the room, allowing sound to be amplified and for worship to be more communal in big spaces. Christopher Page (2010) describes how ‘the acoustic properties of large and vaulted spaces encouraged a style of liturgical music that could resonate within the church, inspiring the development of Gregorian chant’. This transition allowed for people to experiment with new styles of liturgical music. One example is ‘kalophonia’ or ‘kalophonic chant’ (translated from Greek to ‘beautiful sound’), a style of chant that relied on abstraction due to its syllabic and repetitive nature and which could now be carried across the expansive interiors of places of worship therefore enriching the experience of people practicing liturgy.

Another technological development within architecture that allowed for advancement when considering the liturgical experience is the ‘employment of stone’ (Bardill, 2008, pp. 336-352) as a building material as a development from wood or timber. Whilst it is unclear as to whether the material was chosen because of sonic considerations or not, the stone churches supported reverberation much more than previous wooden churches. This meant that vocals, songs and chant would linger in the vast spaces which Margot Fassler (1993) describes as giving ‘a sensory and spiritual weight to the spoken and sound word, fostering a meditative and communal liturgical environment’. This changing acoustic environment, which was now much more in touch with the divine, shaped the content and structure of liturgy which allowed for compositions that were much more elaborate, such as antiphonal singing which is ‘the singing alternately of two choirs, the voices of which differed from each other by the distance of the octave’ (Forth, T. F. 1921, pp. 645-648); a style that would only be able to blossom through the existence of centrally-planned churches. Technological advancements not only allowed the construction of bigger, visually impressing churches but also increased the aural quality of liturgy in the way it was composed, interpreted and performed; allowing liturgy to become much more communal.

To conclude, there is a clear, synchronous relationship between the changing of architectural form in Early Christian and Byzantine churches and the quality of liturgical practice. It can be argued that the transition into centrally-planned churches was the most important factor when considering religious and liturgical advancement, not only due to its ability to allow for congregation in vast spaces but also due to its sonic qualities which allowed for styles of liturgy that had previously never existed and allowed for experimentation in composition. It is also important to consider the nuances of ‘eastern’ vs ‘western’ perspectives of the Christian faith when thinking about the

relationship between architecture and liturgy, these clashes of perspectives lead to theological and geopolitical conflicts that only further encouraged a cohesion in worship, specifically within the 'eastern' perspective.

## Chapter 2

The second chapter of this essay will discuss specific interrelationship between early Christian liturgical spaces and sound as a liturgical device through the suggestion of an increased awareness towards sound which, in turn, allowed for development in architectural form in order to mould liturgical spaces around sonic characteristics. This chapter will begin by exploring the introduction of innovative chant and musical structure, referencing the sonic effect 'drone' which evidences a heightened sonic awareness around the influence of architecture on liturgy and transcendence, therefore leading to developments in Early Christian and Byzantine liturgical spaces. The chapter will then lead into an investigation into the role of reverberant acoustics and auditory perception in the knowledge of the divine or a 'divine presence' which further suggests a specific train of thought, or ideology, around associating sound with a higher power. It will also present a case study of sorts, later, examining Old St. Peter's Basilica in Vatican City in order to attempt to understand how this sonic awareness lead to the development of specific architectural forms and elements that were designed to enhance liturgical sound. Whilst the term sonic awareness has multiple academic interpretations and definitions situated within a variety of different contexts, Heidi von Gunden (1980, pp. 411) explains how 'the theory of sonic awareness promotes sound that is natural since it is often vocal; sound that is free from complicated notational systems; and sound that is powerful in its effects' when referring to Pauline Oliveros' interpretation of sonic awareness. This quote is particularly interesting through the way in which it suggests that sound places a higher importance on its effects as opposed to the way it is notated and its notational systems, but it is important to acknowledge that the quote, in context, explains a relationship that originates with sonic awareness and develops into deep listening; a practice that involves listening to the entirety of a sonic environment in order to gain a further understanding of the sonic world. This excerpt observes that sonic awareness is an ability that relies heavily on sonic effects, such as reverberation, delay, in order to exist. This chapter will portray its ideas through a framework which references the phenomena of sonic effects; examining the importance of these factors when trying to understand how an almost heightened sonic awareness had a profound impact on liturgical spaces and sound as a liturgical device, specifically throughout early Christianity.

The heightened sonic awareness in early Christianity and Byzantium led to vast liturgical development, particularly in chant and composition, to complement the reverberation effects of domed architecture. One of the most crucial developments was the use of the 'ison', a sustained drone note that provided a foundation for Byzantine chant, emphasising the immersive quality of liturgical music. According to Dimitri Conomos, 'the introduction of the ison helped singers navigate the elongated reverberation times in large domed churches, creating a continuous sonic texture that blended seamlessly with the acoustics of the space' (Conomos, 1984). This adaptation allowed for a smoother and more enhanced and transcendent worship experience, aligning with the theological emphasis on divine transcendence. Additionally to this, the rhythm of liturgical texts evolved to align with the acoustic properties of Byzantine churches. Rather than rushed performances, texts were in elongated, drawn out phrases, allowing each note to drone and fade before the next phrase began. Bissera Pentcheva (2010) describes how 'the architecture of Hagia Sophia did not just contain sound; it actively shaped it, influencing the tempo and delivery of the Byzantine liturgy'. This synchronisation of chant and space transformed liturgy into a combined, spiritual event, where sound became a vehicle for religious expression and divine presence. By adapting composition in chant to harmonise with church acoustics, Byzantine architects made sure that worshippers were fully immersed in an auditory experience designed to portray heavenly order and transcendence. This awareness is intertwined with the sonic effect, or concept, of 'drone' described in 'Sonic Experience: A Guide to Everyday Sounds' (Augoyard, 1941, p. 28) as the 'presence of a constant layer of stable pitch in a sound ensemble with no noticeable variation in intensity'. This effect is relevant to Byzantine chant through the idea of transcendence; both the effect and Byzantine chant function as things that 'can reveal the space in which it takes place' (Augoyard, 1941). This corresponds to transcendence as the performance of the 'ison' allowed for worshippers to 'play' the acoustics of the room; revealing the space in which they are in and therefore gaining not only a sonic awareness but also a greater spiritual awareness.

The role of reverberant acoustics in early Christian and Byzantine worship was vital to the perception of a divine presence. The auditory perception of worship was not just functional but was included in theological and spiritual thought. Early Christian liturgical spaces were simply designed to enhance the resonance of sound, allowing spoken word and chant to create a specific spiritual atmosphere that reinforced the idea of divine immanence, the idea that god is present in the world, and in every being. Unlike 'regular' acoustic environments, where speech and song quickly



dissipate, the reverberant qualities of early churches allowed for echoes and overlapping harmonics, creating an almost sonic landscape that immersed worshippers in ‘sacred sound’ (Pentcheva, 2010). This effect was particularly important in the context of chanting and hymns, where the prolonged decay of sound blurred the distinction between human voices and angelic harmonies, evoking the presence of the divine (Nelson, 2018).

In early basilica-style churches, such as San Vitale in Ravenna (500AD) and Sant’Apollinare in Classe (500AD), the high vaulted ceilings, vast naves, and use of stone and mosaic surfaces played a very vital role in shaping the sonic environment and its aural characteristics. These materials had interesting sonic characteristics, meaning that liturgical chants would reverberate throughout the space, prolonging their presence and ‘increasing their perceived intensity’ (Schmidt, 2018). In these churches, worshippers were enveloped in a layered soundscape, where the dichotomy of direct sound and reflected sound created an immersive experience. Theologically, this auditory event was understood as a metaphor for ‘divine omnipresence, where the sustained resonance of sacred texts symbolised the eternity and transcendence of God’s word’ (Jeffery, 2001). Whilst this is another example of reverberation as a sonic effect, it is mostly focused on the concept of resonance and architecture’s ability to resonate. Augoyard (1941, p. 99) describes how ‘resonance requires a relatively high acoustic level’ which suggests that not only architects and designers developed a ‘sonic awareness’ but also worshippers during their prayer; they would control their voices in a way which allowed for resonance.

The acoustic design of early Christian churches also played a role in liturgical hierarchy and sacred authority. The placement of clergy (worshippers) on elevated platforms allowed their voices to be projected clearly across the crowds, reinforcing their liturgical role as the middle between the earthly and the divine (Nelson, 2018). In addition, antiphonal and responsorial (essentially a style of call and response) singing, which were integral to early Christian worship, were amplified by the reverberant spaces, allowing for sonic continuity between different sections of the church. This spatialised sound distribution enabled a participatory and shared worship experience, drawing both clergy and the crowd into a shared acoustic environment.

This use of reverberant acoustics in early Christian and Byzantine architecture highlights a progressive awareness of sound as a liturgical tool. These spaces were not just built to accommodate growing crowds but were designed to shape the worship experience through sound, ‘the reverberation of sacred chants and prayers transformed physical space into a sonic

representation of the divine, reinforcing the connection between architecture, theology, and auditory perception' (Schmidt, 2018). Through these developments, early Christian architects and designers were able to elevate liturgical worship, ensuring that the sonic environment resonated with the spiritual aspirations of the faithful.

Additionally, this chapter will now present a case study of a work of liturgical architecture. A good example of an early Christian liturgical space that evidences an awareness of sound and therefore influence on architecture is Old St. Peter's Basilica, constructed under Emperor Constantine in the 4th century. The structure is a crucial early Christian landmark that substantiates the intersection between liturgical function and acoustic innovation.

One of the most important aspects of Old St. Peter's acoustic design was its interpretation of the traditional basilica model, which allowed for a spacious and longitudinal form conducive to sound projection. The long nature of the building, designed with aisles and ending in a semi-circular apse, created a natural 'stage' for sound, allowing for the amplification of speech and prayer. This design ensured that 'the spoken word could be clearly heard across the large congregational gatherings' (Krautheimer, 1986, p. 53). The use of hard, solid materials such as stone and marble only further enhanced the basilica's acoustics, contributing to the reverberant quality that was needed for the delivery of effective prayer, worship and liturgy (White, 1997, p. 120). This architectural layout therefore functioned as an acoustic chamber of sorts, allowing for an aural experience that reinforced the sacredness of the liturgical act.

Additionally, Old St. Peter's Basilica incorporated architectural elements specifically designed to shape and give a directional factor to sound. The elevated position of the 'ambo', where scripture was commonly read from, meant for a higher point for vocal projection, ensuring 'clarity and audibility even in the vast interior space' (McKinnon, 2000, p. 85). Similarly, the placement of the altar under a ciborium or baldachin, a canopy of sorts, created a focal point not only for visual attention but also for sonic resonance, with the canopy reflecting sound waves evenly throughout the nave (De Blaauw, 2012, p. 22). These features evidence an intentional consideration of acoustic performance in the design of liturgical architecture.

To conclude this case study, and the chapter as a whole, Old St. Peter's Basilica of the 4th century is an detailed historical demonstration of an awareness towards sound, and the effects of sound and that despite a lack of technical knowledge surrounding the scientific intricacies behind the reasons

for these effects at the time, designers made architectural choices specifically with these effects in mind in order to develop liturgical practice and worshippers developed their prayer through an undefined but thorough and gradual understanding of sonic effects.

## Chapter 3

The third and final chapter of this essay will strive to understand these historical sonic, architectural and religious relationships. Despite technical understanding coming later on, sound and liturgy are deeply rooted in the historical evolution of religious practices. Sound often served as not only a functional component of worship, the physical practice, but also as a symbolic component of worship. When referring to early Christianity, there needs to be a fundamental understanding of its cultural influences and traditions that sonically shaped liturgical spaces and practice. This chapter will contextualise the role of sound theologically by exploring and examining historical lineages including Judaic worship, Greco-Roman sound, aural and acoustic awareness as well as the role of sound, both philosophically and theologically, in the ancient world. By the end of this chapter, a clear synchronicity between these historical contexts and the development of sound as an integral part of early Christian liturgy and architecture will form.

The roots of early Christian liturgy are deeply connected to Judaic worship practices, where sound played a very important role in the expression of faith and liturgy. The use of vocals, spoken word, chanting of prayer, and instrumentation were fundamental to biblical and hellenistic Jewish worship and later synagogue practices. White (1997, p. 45) describes, ‘the recitation of scripture and the singing of hymns created a sonic environment that fostered collective participation and spiritual reflection.’ This emphasis on vocalised prayer and scripture reading carried over into early Christian gatherings in their private home-style churches, establishing the incorporation of sound into worship.

Additionally, the architectural design of Jewish sacred spaces was realised by an early awareness of acoustics. The construction of the Second Temple in Jerusalem (built around 500 BCE), with its vast courtyards and stone surfaces, allowed for the projection and resonance of sound, emphasising the auditory experience of communal prayer (Krautheimer, 1986, p. 28). This tradition of creating

spaces that amplified liturgical worship was later adapted in early Christian basilicas, making for a continuity of acoustic and sonic awareness and its importance in worship.

The model of a synagogue (which began to appear around 300 BCE) also created a blueprint for early Christian house churches and worship spaces that bridged the gap between house churches and early structures such as basilicas. Spatial configuration and potential for sound projection meant that scripture readings and prayers reached the entire congregation clearly and effectively. De Blaauw (2012, p. 600) explains how ‘the spatial and acoustic design of Jewish worship spaces played a crucial role in shaping early Christian architectural and liturgical practices, creating an environment where sound reinforced communal identity and theological expression.’

Whilst Judaism and Judaic interpretations of the importance of sound on worship contributed to the early Christian understanding, it can be argued that the Greco-Roman period had much more influence due to continued philosophical views and the adaptation of former Roman spaces into early Christian liturgical spaces.

The Greco-Roman period, which lasted between around 300 BCE and 400 AD, the period in which early Christianity emerged, contributed greatly to the development of architectural forms and structures that placed a high important acoustic performance, both liturgically and in general life. Theatres and churches of the Roman Empire were designed with complicated acoustic characteristics, ensuring that speech and music could be clearly heard by large audiences. According to Mathews (1971, p. 64), ‘the semi-circular design of Roman theatres and the use of reflective materials created an optimal sound environment, demonstrating an advanced understanding of acoustic dynamics.’

Early Christian architects were inspired by these factors when considering designing spaces for worship, adapting the Roman basilica model for ecclesiastical purposes. The long nave, high ceilings, and hard surfaces found in early Christian churches allowed for the propagation of sound, creating an immersive sonic space. De Blaauw (2012, p. 598) describes how ‘the adaptation of Roman architectural forms allowed Christian worship spaces to accommodate large congregations while preserving the clarity and resonance of liturgical speech and song.’ This architectural lineage underscores the influence of Greco-Roman acoustic knowledge on the development of Christian liturgical spaces, particularly early basilica-style churches such as San Vitale and Sant’Apollinare referenced in chapter two.

The Roman emphasis on liturgy and the acoustics of speech further informed the design and construction of early Christian liturgical spaces. McKinnon (2000, p. 45) describes how 'the clarity of spoken word was essential for both civic and religious gatherings in Roman society, shaping architectural choices that optimised acoustic performance.' The importance placed upon clarity and projection translated into early Christian basilicas, where the chanted elements of liturgy needed spaces that could carry sound across large crowds without electronic amplification; a concept that hadn't yet been realised.

Whilst early Christianity was very much influenced by other religions and traditions regarding the discovery of the relationship between sound and liturgy, there are also philosophical and theological considerations that have impacted this relationship.

Beyond these practical considerations, the historical relationship between sound and liturgy is also interwoven in philosophical and theological interpretations of sound's spiritual importance. In the classical antiquity age (from around 800 BCE to 500 AD), sound was often perceived as a medium through which the divine could be experienced and understood. Whilst never writing about sound in depth, Plato and Aristotle's writings still suggest an appreciation for the more esoteric qualities of sound, associating characteristics such as harmony and proportion with cosmic order and spiritual insight (Jeffery, 2001, p. 33). An example of one of these writings is Plato's 'Timaeus' which discusses the 'music of the spheres', an idea that the order we find in music reflects the divine order in reality through connecting concepts such as sound and harmony to the structure of the universe.

This philosophical framework heavily influenced early Christian thought, where sound was seen as a way of connecting with the divine and facilitating spiritual connection. Augustine of Hippo, in the 4th century AD, spoke on the effective power of music and voice in worship, explaining that 'singing and the modulation of voice elevate the soul and direct the heart toward divine contemplation' (Augustine, 397). This integration of sound and spirituality influenced the development of early Christian liturgical practices, where the sonic experience was seen as essential to the transcendent potential of worship.

The relationship between sound and liturgy in early Christianity is very deeply rooted in historical tradition and cultural influence that shaped both the practice and architecture of worship. Moving from the sonic environments of Jewish temple worship, which can be closely compared to the private home churches in early Christianity, to the layouts of Greco-Roman architecture and the

philosophical arguments for sound's spiritual significance that stemmed from antiquity, these lineages created a foundation for the development of early Christian liturgical spaces and practices. By contextualising the involvement and importance of sound into early Christian worship, this chapter provides a framework for understanding the never-ending importance of acoustics in the design and experience of sacred liturgical spaces, as well as the role of sound as a liturgical device.

## Conclusion

To conclude, this paper aimed to explore the sonic characteristics of early Christianity and Byzantium by examining a range of different factors mostly focusing on the complex relationships between sound and worship. The importance of liturgical architecture when concerning worship and relationship to sound was explored in the first chapter, whilst the second chapter aims to explore liturgical architecture and sound as a liturgical device and how these factors influenced a sonic awareness, discussing the significance of sonic effects as method for a heightened awareness of sound within a theological context. The third chapter situated the rest of the paper and its ideas within a multitude of historical and philosophical contexts such as Judaic worship, Greco-Roman attitudes towards liturgical architecture and the continuity in the perceived role of sound from antiquity into the beginning of early Christianity.

This paper, strived to explore the reasons for and ramifications of the development of liturgical architecture from the traditional longitudinal basilicas to the bigger centrally-planned cathedrals. Investigating political, theological and geographical factors, the analysis found that the role and progression of Christianity as a faith was vital in the development of liturgical architecture. Christianity was not a legally recognised religion for a number of years and, therefore, liturgy was performed in private houses which, in turn, allowed for unique sonic characteristics and methods of performance. Private houses encouraged and nurtured the concept of 'collective singing' and 'chanting'. Additionally, theological and geographical conflicts were proposed as reasons for the development in religious worship spaces, the 'Great Schism' noted as being a crucial timestamp in which eastern and western perspectives of Christianity diverged and lead to different interpretations of what liturgical architecture should be. It is clear that the eastern, or orthodox, perspective placed more value on the idea of sound as a communicative device evidenced in their centrally-planned

structures, as opposed to the western perspective which valued a more monastic approach to worship, evidenced by the continued use of longitudinal basilicas in modern Christianity.

Furthermore, this paper aimed to pose the idea of a heightened sonic awareness allowing for development in architectural form, in order to mould liturgical spaces around sonic characteristics. These sonic characteristics can also be defined as 'sonic effects'. Research throughout the second chapter found that this heightened sonic awareness is evidenced in the fundamental understanding of a selection of sonic effects such as reverberation, drone and resonance. The second chapter also examined a case study of a specific basilica church, Old St. Peter's, in order to reinforce the proposed relationship between a fundamental understanding of sonic effects and the development of liturgical architecture. The final chapter compounded the historical influence on early Christianity and Byzantine architecture and attitudes towards sound; Judaic architecture, which influenced the early private home churches of early Christianity, proved the importance of spatial consideration in liturgical architecture whilst the Greco-Roman period was used as an inspiration and foundation, architecturally, in order to allow for clarity in acoustics which, in turn, developed liturgical practice.

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