

Edifice and Education: Structuring Thought in Twelfth-Century Europe

Volume 1: Text

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Short Abstract

This thesis explores the diverse range of textual and visual architectural representations in twelfth-century didactic texts. It argues that these representations are not arbitrarily chosen frameworks for holding data; instead, architecture can perform a certain pedagogical role. In this role architectural representations mediate between imperceptible abstract concepts in the text and the tangible world of the reader. By focusing on the relationship between text and image this thesis argues that the two play a meaningful part in conveying intangible elements of the world to the reader. The thesis creates an alternative to the historiography on architecture and its representations by redirecting focus from the development of technical drawings and onto the intellectual context of the drawings, and ultimately questions why architecture, in particular, appears so frequently in didactic manuscripts of the period.

The argument is framed by two points. First, it recognises the manifold ways in which architectural representations appear by focusing on three particular examples: quadrivial texts, Richard of Saint Victor's *In visionem Ezechielis*, and Honorius Augustodunensis' *Gemma animae*. These texts provide case studies to argue the primary point of thesis, namely, that architectural representations were used to provide tangible or kinaesthetic models to aid readers' understanding of difficult material. Second, the language and structure of the three studies reflect a dimensional framework that was used to articulate particular aspects of the drawings. The dimensional aspects of the drawings appear in texts as references to length, width, height, and the typological qualities of architecture.

Overall the thesis has two important implications. First by recognising the important relationship between text and image it is possible to draw out the pedagogical aims and processes present in some twelfth-century didactic works. Second, common examples of architectural representations, such as Gospel canon tables, are recognised as part of a broader spectrum of heuristic images and diagrams.

Long Abstract

This thesis explores the diverse range of textual and visual architectural representations in twelfth-century didactic texts. It argues that these representations are not arbitrarily chosen frameworks for holding data; instead, architecture performs a certain pedagogical role. In this role architectural representations mediate between imperceptible abstract concepts in the text and the tangible world of the reader. The thesis argues that architecture and its implied monumentality provided an anchor for abstract subjects such as mathematics and historical exegesis.

The thesis creates an alternative to current historiography on architecture and its representations in several ways. Much of the art historical scholarship on the subject has been devoted to arguing one way or another that architectural representations in manuscripts parallel twelfth- and thirteenth-century developments in architectural practice. In particular, that during the central Middle Ages technical drawings of buildings began to be used on contemporary building sites. This thesis does not accept or reject that view, but seeks to understand architectural representations within their immediate context; that is, in relation to any didactic texts which may accompany them. Recent scholarship on architectural representations has emphasised their use in medieval mnemonic practice. This thesis builds on that discussion by highlighting examples of representation which were not necessarily used to recall data, but was used to organise and index it instead.

The argument is framed by two points. First, it recognises the manifold ways in which architectural representations appear and therefore focuses on three particular examples: quadrivial texts, Richard of Saint Victor's *In visionem Ezechielis*, and Honorius Augustodunensis' *Gemma animae*. These texts provide case studies to argue the primary point of the thesis, namely, that architectural representations were used to provide tangible or kinaesthetic models to aid readers' understanding of difficult material. These examples are chosen because they provide the clearest and most sophisticated use of architectural representations in medieval educational literature. Furthermore, the three studies are not isolated or rare examples; instead, they appear in a relatively large number

of manuscripts from around the twelfth century, and would have been known by many educated readers of the time.

Second, the language and structure of the three studies reflect a dimensional framework that was used to articulate particular aspects of the drawings. This dimensional framework can be discerned in the many references to length, width, height, and the typological qualities of architecture. The thesis argues that the text/image relationship in each case study may be best understood in reference to the dimensional language which appears in it. Quadrivial texts make frequent and sustained references to the 'length and width' in accompanying architectural drawings meaning they may be identified as two dimensional. Richard of Saint Victor's *In visionem Ezechielis* and its highly detailed plans and elevations seek 'truth' and attempts to proof the veracity of its claims through the three-dimensional recreation of the Temple which appears in the prophet Ezekiel's vision. Honorius Augustodunensis describes a medieval church and takes the reader on an imaginary walk through it in his *Gemma animae*. During this walk Honorius teaches the reader about Christian history by describing the church and its ornaments as directly linked to the past.

The thesis presents a spectrum of evidence to answer the questions: why is architecture used to teach in twelfth-century Europe, and how was it presented to the reader to make an effective learning tool?

Chapter 1 – Architecture and the Quadrivium

Chapter one examines schematic drawings of architecture which appear in texts directly or indirectly related to the subjects of the quadrivium: arithmetic, music, geometry, and astronomy. These texts were intended to be pragmatic in nature; the presence of drawings and the manner in which they are presented, should – in theory – reflect this utilitarian approach. The use of these diagrams was not an arbitrary process of decoration, but an attempt to make abstract or insubstantial concepts more accessible. The intangible nature of numbers, music, and computation meant it was difficult for some students to grasp the concepts underlying these subjects. The language associated with these subjects

and each of their texts frequently draws on architectural or spatially derived vocabulary (i.e., *longitudo*, *latitudo*, *tramitus*, *casa*), which in many cases directly refers to an architectural image alongside it. In these instances there is a clear correlation between text and image; the text refers to locations within the image using architectural words so the reader can follow the train of thought. Furthermore, examples of the same texts which do not have architectural representations alongside them frequently do not use this architectural vocabulary. Supporting this thesis, architectural diagrams rarely appear in texts associated with astronomy. Stars and planets, the object of study in astronomy, have a tangible existence which can be recorded without need to create architectural frameworks to hold data about them. Architecture is used in some texts of the trivium (grammar, rhetoric, and logic), but limitations on space means these cannot be fully explored in this work; also, previous scholarly work has broached the subject.

Chapter 2 – Richard of Saint Victor and Three Dimensional Architecture

Chapter two argues that Richard of Saint Victor's *In visionem Ezechielis* and the drawings included are a part of the author's intent to convey the truth of history to the reader by recreating a set of structures in a highly detailed three-dimensional manner. Scripture describes a number of buildings, but Ezekiel's vision of the Temple complex (Ez. 40-48) is the most complete and detailed. The prophet describes the buildings he witnessed while escorted around the complex on a mountaintop in terms of their length, width, and height. Gregory the Great, in his sermons on Ezekiel, discussed the contradictory nature of these measurements and concluded that the structures and their descriptions could not be understood literally, only in an allegorical manner. Richard of Saint Victor disagreed in his commentary on Ezekiel's architectural vision, *In visionem Ezechielis*, and offered a painstaking literal description of the Temple as well as the surrounding buildings. Richard includes eleven drawings in order to clarify and prove the points he argues, so Ezekiel's vision could be understood literally.

Richard's concern is to imbue his descriptions and drawings with an accurate account of the length, width, and height of the structures; giving them a geometrical or schematic appearance, thus creating

a three-dimensional set of structures in the process. During his work Richard uses an approach founded in the quadrivium, specifically geometry, as described in the first chapter of this thesis. By including geometric ideas and language into his recreation of the past Richard creates a tactile and rational world created via the text and image. For example, the language Richard uses to describe his drawings (*plana figuris*), reflects a similar usage in the texts concerned with geometry. By recreating a sophisticated architectural space Richard is undertaking an act of ‘worldbuilding’, one which is supported by the text’s root in geometry.

Previous work on the appearance of architecture in this context focuses on the possible mnemonic qualities of the subject. Architectural backdrops formed one of the most popular methods of training a memory in the Middle Ages, where objects, which represent memories, were placed into imaginary courts and houses. These buildings of the mind could then be located when one wanted to recall the specific memory, in the form of the object one had originally placed there. The appearance of detailed architectural drawings, such as those found in Richard’s work, would seem to reaffirm the mnemonic importance of architecture. However, as indicated in the first chapter, architectural drawings also play an important role in learning and understanding, not only remembering. The prominence of drawings in pedagogical texts lends their support to developing understanding of difficult points, such as the exact appearance of a structure that had never existed in the case of Ezekiel’s vision.

Chapter 3 – Honorius Augustodunensis’ Four-Dimensional Architecture

Chapter three describes textual architectural representations in terms of four dimensions. The addition of time to the reading of architecture allows for the thesis to move from the study of history to examine the contemporary interpretation of buildings which are typologically linked with the events, people, and objects in Scripture. Honorius Augustodunensis’ *Gemma animae* presents an overview of twelfth-century liturgical practices. In book one Honorius includes a detailed account of a church’s appearance, orientation, and liturgical objects; drawing comparisons between particular architectural elements of the medieval church and architecture which appears in Scripture.

Honorius writes that one aim of writing many of his works is to help educate people. In many of these works Honorius describes objects and architectural structures to help the student gain insight into abstract ideas or the imperceptible past. I have used the term 'didactic materialism' to describe the use of material culture in this pedagogical context. Honorius specifically discusses the past in this context, linking physical objects with Christian history in a manner reminiscent of typological exegesis. To fully explain this process, the third chapter of the thesis includes a discussion of relevant medieval theories of time with a view to determining a 'scientific' basis for incorporating time into readings of architectural representations. According to one medieval theory of time, the past and future could only be understood through the 'immediate perception' of the present and the world around the subject. If this is correct, Honorius' use of a medieval church takes advantage of a person's perception by allowing them to consider the past in a tangible way.

In his *Gemma animae*, Honorius begins his description of the medieval church with the altar. He separates the building into a hierarchical arrangement; the walls, windows, portals, columns, and capitals are interpreted as being a sign of certain facets of the past and future. Honorius proceeds with his description of the church building from east to west, along the longitudinal line of the building. A similar emphasis on an east-west orientation appears in contemporary works; for example, Hugh of Saint Victor's *The Mystic Ark*. Both Honorius and Hugh add the dimension of time to this movement from east to west, giving a sense of narrative control to the teaching of Christian history. Honorius' innovation in using material culture, and architecture in particular, to help students associate the imperceptible past and future with their immediate surroundings cemented his reputation as a teacher.

In sum, this thesis takes examples of architectural representations and asks why they were created. It also asks, especially in the case of Richard's *In visionem Ezechielis*, how they were created. The representations which form the focus of the thesis may be said to have important pedagogical value, but this may not be the case with all medieval architectural representations. However, this thesis aims

to show that one common use for architecture in the twelfth century was to act as a tangible image that allowed the reader to go further and consider the imperceptible elements of the universe. Overall the thesis has two important implications. First by recognising the important relationship between text and image in didactic texts it is possible to draw out the pedagogical aims and processes present in some twelfth-century texts. Second, common examples of architectural representations, such as Gospel canon tables, are recognised as part of a broader spectrum of heuristic images and diagrams.

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Introduction

Medieval Architectural Representations and Its Contexts

Architecture commonly appears in medieval manuscripts. It sets the scene for a narrative and it frames information. Architecture also defines the boundaries of the medieval church, and informs the people within it. It is the celestial Jerusalem to which Christians look forward at the end of time, and it is a reflection of heaven on earth. God is the architect of the cosmos, depicted with a pair of compasses as he measures the boundaries of his creation; creating order out of chaos. The iconographic identity of architecture given by those who regularly used and inhabited it during the Middle Ages has bred multiple studies of the subject.¹ Architectural representation is a relatively simple act of creation with no need of stone, mortar, site, or expertise of the mason; only parchment, quill, and ink are required. Drawing a house, church or castle is an act of creation which tells the modern viewer something about how architecture was interpreted and viewed during the Middle Ages. The context in which that creation takes place can tell us even more. Unlike physical architecture, architectural representations, despite their common appearance in medieval manuscripts, have been rarely examined. This thesis focuses on textual and visual representations of architecture in twelfth-century didactic texts. More specifically it determines how architectural representations were used to 'structure' information, creating order out of chaos, an echo of God's act at the beginning of time. It also attempts to address the question of why architecture in particular was such a common framework in these types of texts.

¹ The formative study of architectural iconography is, Richard Krautheimer, 'Introduction to an "Iconography of Medieval Architecture"', *JWCI*, 5 (1942), pp. 1-33. Further work can be found in, Eric Fernie, 'Archaeology and Iconography: Recent Developments in the Study of English Medieval Architecture', *Architectural History*, 32 (1989), pp. 18-29.

The questions this thesis seeks to address derive from architectural histories which suggest that there was little need for architectural drawings between antiquity and the thirteenth century, which is why there are so few of them. For example, Robert Branner writes that 'architectural drawings were of course made throughout the Middle Ages, but prior to the Gothic period they always seem to have been programmatic or simply representational in nature.'² Branner is correct when writing that architectural drawings made before the thirteenth century were programmatic; however, the volume of examples from this period suggests the question, if the drawings were not made to illustrate the appearance of a particular structure, why draw them in the first place? What purpose do the merely 'programmatic' and 'representational' drawings serve? In addition to questions regarding the purpose of architectural representations, Branner argues that cohesive representations of three-dimensional structures do not exist before the thirteenth century, if this is so, without the presence of any paradigmatic method of representing architecture, how do authors and artists before the thirteenth century create architecture? In essence, the questions underpinning this thesis ask why and how architectural representations were used in particular situations. Importantly, it will also consider what advantages architectural representations in particular offered the medieval author, reader and student.

In contrast to technical drawings of architecture, which form the focus of Branner's study, less formal drawings of architecture and architectural elements appear in many places in the twelfth century, we need to ask ourselves why. This thesis will argue that architectural imagery is used as a cognitive and pedagogical device to present abstract knowledge in a solid and practical form. The very solidity and quotidian nature of buildings and the elements which

² Robert Branner, 'Villard de Honnecourt, Reims and the Origin of Gothic Architectural Drawing', *Gazette des Beaux-Arts*, 61 (1961), pp. 129-146, here p. 129.

make up buildings is used as a contrast to abstract information, to make it more 'real' and accessible to the reader. For although it can be difficult to comprehend abstract information when presented by itself, when organised within the bounds of something as solid and well-known as architecture, it becomes much easier to grasp.

This is a large claim and not provable in the sense that this thesis can examine every instance of drawings of architecture in the twelfth century. Instead, the thesis offers discussions of three major instances of occasions when drawings of architecture are common: texts related to the quadrivium; Richard of Saint Victor's commentary on the book of Ezekiel; and Honorius Augustodunensis' text, *Gemma animae*. These three examples have been chosen because they employ architecture in different ways – which I have characterised as two- three- and four-dimensional uses of architecture. It will involve, too, a number of discussions of the language used to describe architecture, and the way this evolves. The variety and quantity of examples employed means that my method of proceeding is, by necessity, not linear. Each chapter will present a number of examples to resemble more of a constellation of evidence rather than a straight-line argument. This does require some patience on the reader's part, but I would contend that this better represents the way that architecture came to be employed in medieval texts than a simple cause and effect solution.

The thesis approaches the research questions of how and why architectural imagery was incorporated into medieval manuscripts and didactic texts by using different sources in different ways. In the first chapter we examine why arcades appear in quadrivial texts and the role of architecture in twelfth-century education. In chapter two, Richard of Saint Victor's commentary uses an architectural vision, and hence it is unnecessary to deal with why architectural drawings were used here. However, given that Richard presented a complete series of plans and elevations to illustrate his argument the presence of these detailed

drawings raises the question of how Richard was able to represent three-dimensional structures on a two-dimensional surface. Finally, Honorius Augustodunensis takes advantage of the consistent layout of churches to assign particular structures in the church to moments in Christian history. Each text teaches a different subject but each also incorporates architecture as a vital part of a broader didactic objective.

Most studies of medieval technical drawing begin in the thirteenth century. Villard de Honnecourt's (d. c. 1230) portfolio of architectural drawings and iconographical images (Paris, BnF, MS fr. 19093) has been canonical in the study of architectural drawings, and is considered by many scholars to be the genesis of modern technical drawing.³ The portfolio contains sixty-five pages, in which there are approximately 250 drawings, many of which depict architectural subjects. The schematic and detailed nature of the drawings, specifically the moulding profiles of mullions, make it appear that the drawings could have been used on the medieval building site, although not all scholars agree.⁴ James Ackerman, amongst others, highlights Villard's drawings as 'reflect[ing] a milestone in the formation of the conventions for the representation of architectural works.'⁵ They are important because they illustrate Villard's attempt to depict entire structures using architectural conventions one might recognise today, such as elevations, plans, and sectional elevations, which may or may not echo the techniques used by

³ The bibliography on Villard de Honnecourt is immense; for a summary see: Carl Barnes Jr., *Villard de Honnecourt, the Artist and his Drawings: A Critical Bibliography* (Boston, 1982); for a recent selection see: *idem*, *The Portfolio of Villard de Honnecourt: a New Critical Edition and Color Facsimile* (Farnham, 2009). Before his death in 2012 Barnes also kept an up-to-date annotated bibliography, now found at: <http://www.avista.org/villardman/villard-bibliography> [accessed: 4/2/2015].

⁴ Compare Bucher's statements that Villard was 'a lively, versatile mason-contractor, and [...] may have occasionally worked as a sculptor and furniture designer', in Francois Bucher, *Architector: The Lodge Books and Sketchbooks of Medieval Architects*, vol. 1 (New York, 1979), p. 15, with Bechmann's hesitation to assign a particular role for Villard in, Roland Bechmann, *Villard de Honnecourt: la Pensée Technique au xiii^e Siècle et sa Communication* (Paris, 1993), p. 13.

⁵ James S. Ackerman, 'Villard de Honnecourt's Drawing of Reims Cathedral: A Study in Architectural Representation', *Artibus et Historiae*, 18 (1997), pp. 41-49, here p. 41.

contemporary masons and 'architects.'⁶ For example, on page sixty-one Villard provides an internal and external set of elevation drawings which accord with each other accurately (fig. 1).⁷ The drawing portrays a concern for the entire structure, and not just individual parts of the building, a characteristic of earlier Romanesque architectural representations, as we will see. Villard's portfolio may have formed part of a movement towards technical drawing during the early thirteenth century; nevertheless, he was still bound by the 'conventions,' to which Ackerman alludes.⁸ In Villard's portfolio an entire edifice, both internal and external, becomes the object of observation for the first time; the portfolio stands as an example of how at least one artist interpreted his architectural environment.

After Villard's portfolio, the genre of technical architectural drawings gathered strength.⁹ The effigy of Hugh Libergier, an architect at Reims, dated to the middle part of the thirteenth century, supports an emerging picture of architecture and architect becoming a professional vocation. A pair of compasses and straight edges are placed alongside the effigy as emblematic of Libergier's profession; tools used for the creation of architectural drawings.¹⁰ Contemporary with the identification of an architect in this way, the earliest known drawings which almost certainly come from an architect's workshop are two from Strasbourg, which may form early designs for Strasbourg cathedral's facade (figs. 2 and 3).¹¹ Drawing A uses plane

⁶ For a discussion of the term 'architect' and its meaning in the Middle Ages see Nikolaus Pevsner, 'The Term "Architect" in the Middle Ages', *Speculum*, 17 (1942), pp. 549-62.

⁷ Bechmann, *Villard*, p. 85. Bechmann discusses another set of elevations which appear on page 60 of the portfolio, but which also depict Reims cathedral. While the drawing is consistent, it does not perfectly represent the finished bay or external appearance of the cathedral.

⁸ Robert Branner, 'Villard de Honnecourt, Reims and the Origin of Gothic Architectural Drawing', *Gazette des Beaux-Arts*, 61 (1963), pp. 129-146, here p. 141.

⁹ Palaeographical evidence suggests that the portfolio was added to after Villard's death, Barnes identifies eight hands in total, Barnes Jr., *Villard*, pp. 11-14.

¹⁰ Christopher Wilson, *The Gothic Cathedral: the Architecture of the Great Church, 1130-1530* (London, 2000), pp. 134-135.

¹¹ Robert Bork, 'Plan B and the Geometry of Facade Design at Strasbourg Cathedral, 1250-1350', *JSAH*, 64 (2005), pp. 442-473. Bork provides an excellent overview and examination of the relationship between the cathedral and the two architectural drawings associated with it.

figures, such as the triangle or circle, to construct sophisticated shapes which help form the various parts of the building's facade. Such forms provide a basic shape around which the building is constructed, and were constructed using 'simple manipulations of the compass and straightedge'.¹² Drawing A was completed around 1260, and forms the best evidence for the use of plane shapes and the sophisticated use of architectural-drawing techniques by the middle of the thirteenth century.¹³ A slightly later architectural drawing can be found in a palimpsest at Reims, completed before 1270 (Reims, Dépôt annexe des Archives Départementales de la Marne, MS G 661).¹⁴ There are eight palimpsest leaves, two of which partially illustrate large church facades; the remainder show architectural elements and decorations. The lines were created using pinpricks, which suggests they were made by tracing one line on to another. In the following century, architectural drawings had become widespread enough for at least one to become part of a binding legal document in Siena, Italy, indicating what the completed structure should look like.¹⁵

Many of these drawings were completed during the thirteenth century, may be linked with the medieval mason or particular buildings, and have been studied primarily by architectural historians. They provide evidence for the development of medieval architectural processes, as well as the re-emergence of the architect as a designer of structures, and not a master mason working from rules of thumb passed down from master to apprentice.¹⁶ By

¹² Ibid., p. 442.

¹³ In Plan A only half the building is illustrated because the missing half would have been a mirror image, making it unnecessary to take the time to complete it.

¹⁴ There are two primary studies which consider the Reims palimpsest, Robert Branner, 'Drawings from a Thirteenth-Century Architect's Shop: The Reims Palimpsest', *JSAH*, 17 (1958), pp. 9-21; and Stephen Murray, 'The Gothic Facade Drawings in the 'Reims Palimpsest'', *Gesta*, 17 (1978), pp. 51-56.

¹⁵ Franklin Toker, 'Gothic Architecture by Remote Control: An Illustrated Building Contract of 1340', *The Art Bulletin*, 67 (1985), pp. 67-95.

¹⁶ Cf. Lonnie R. Shelby, "'Medieval Masons' Tools: The Level and the Plumb Rule', *Technology and Culture*, 2 (1961), pp. 127-130; *idem*, "'Medieval Masons' Tools II. Compass and Square', *Technology and Culture*, 6 (1965), pp. 236-248.

focusing on the drawings as a result of these developments scholars have approached pre-Gothic (i.e., Romanesque) architectural representations backwards, looking to explain the development of technical drawing.¹⁷ In contrast, this thesis is not concerned with the possibility that technical architectural drawings were used on the Romanesque building site. Instead, it hypothesises that architectural drawings which survive from the twelfth century were confined to a context outside the building site and are rooted in the medieval intellectual context of the monastery.¹⁸ A chronological outline of early medieval architectural drawings and representations, given below, underlines the association between early medieval architectural representations and the monastic environment. So instead of attempting to identify the proto-history of technical drawings in the Romanesque period, this thesis asks why architectural representations were commonly depicted by monks.¹⁹ These earlier architectural representations do not point to a linear development of architectural drawing, but are, instead, sustained by their own intellectual context, one distinct from the medieval mason's concerns.

The 'intellectual context' under discussion is marked by important changes during the course of the twelfth century, that is, from the century before the conventions of technical drawing, as evident in Villard's portfolio and others, became apparent. It is this period, the so-called 'twelfth-century renaissance,' which forms the chronological focus of this thesis.²⁰ The

¹⁷ For example, Robert Branner, 'Villard de Honnecourt', pp. 129-146; and Ackerman, 'Villard de Honnecourt's Drawing', pp. 41-49. J. Gardelles, 'Recherches sur les origines des facades à étage d'arcatures des églises médiévales', *Bulletin Monumental*, 136 (1978), pp. 113-133; W. Scholler, 'Le dessin d'architecture à l'époque gothique', in R. Recht (ed.), *Les bâtisseurs des cathédrales gothiques* (Strasbourg, 1981).

¹⁸ This is not to preclude the possibility that the monastic drawings that will be discussed did not influence or were influenced by contemporary building practice, however, the available evidence makes it difficult to argue either way.

¹⁹ During the thesis I use the terms 'architectural drawings', and 'architectural representations' interchangeably. When discussing drawings which may have been used during the construction process I refer to them as 'technical drawings.'

²⁰ The phrase was first coined in Charles Homer Haskins, *The Renaissance of the Twelfth Century* (Cambridge, Mass., 1927, repr. 1955). Important works include, C.R. Young (ed.), *The Twelfth-Century Renaissance* (New York, 1969); W. Treadgold (ed.), *Renaissances before the Renaissance – Cultural Revivals of Late Antiquity and the Middle Ages* (Stanford, 1984); R.L. Benson, G. Constable (eds.), *Renaissance and Renewal in the Twelfth Century*

period has been considered a high point of the Middle Ages, and as 'the preparation of a new age in the history of Christian thought.'²¹ One preparatory structure, and one of the most long-lasting outcomes of the twelfth century, was the establishment of secular educational institutions, such as the universities of Paris and Oxford.²² The development of these institutional arenas ran parallel with changes in pedagogical strategies and hence the intellectual context of the period. For example, Stephen Jaeger has highlighted the transference of emphasis from a charismatic to a text-based approach to educating the twelfth-century student.²³ By orientating the learning process towards the text scholars were forced to – or had the opportunity to – rethink their didactic methods, in particular, for our purposes, the manner in which visual material might be incorporated alongside the text.²⁴ The reification of pedagogical strategies and investigative tools created a renewed positive attitude in man's ability to understand the universe. During the course of this discussion, forms of diagrams, other than those which employed architecture will be discussed to determine their particular function in didactic texts.

During the twelfth century there was a new acknowledgement by scholars that the physical world held the potential to be a valid object of study which may lead to a greater understanding of God.²⁵ It was in the twelfth century that Adelard of Bath stated that he

(Oxford, 1982, repr. 1991). A list of works may be found in C. D. Ferguson, *Europe in Transition – a Select, Annotated Bibliography of the Twelfth-Century Renaissance* (Garland, 1989).

²¹ Etienne Gilson, *La philosophie au moyen age: des origines patristiques a la fin du XIVe siècle*, 2nd ed (Paris, 1952), p. 337.

²² While the universities were not officially incorporated until the beginning of the thirteenth century their origins lay at the end of the twelfth. See, Stephen C. Ferruolo, 'Parisi-us-Paradisus: The City, Its Schools, and the Origins of the University of Paris', in Thomas Bender (ed.), *The University and the City: from Medieval Origins to the Present* (New York; Oxford, 1988), pp. 22-43. For Oxford, R. W. Southern, 'From Schools to University', in J.I. Catto (ed.) *The History of the University of Oxford*, vol. 1 (Oxford, 1984), pp. 1-36.

²³ C. Stephen Jaeger, *The Envy of Angels: Cathedral Schools and Social Ideals in Medieval Europe, 950-1200* (Philadelphia, 1994). Concerning diagrams see, Patrice Sicard, *Diagrammes médiévaux et exégèse visuelle: le libellus de formatione arche de Hugues de Saint-Victor* (Paris, 1993).

²⁴ For example Patrice Sicard writes that the diagram became a replacement for the teacher, *Ibid.*, p. 101, fn. 18.

²⁵ Lynn White Jr., 'Natural Science and Naturalistic Art in the Middle Ages', *The American Historical Review*, 52 (1947), pp. 421-435.

'follows the example of the Arab masters who use rational arguments, rather than blindly following authority.'²⁶ Adelard translated Euclid's *Elements* from Arabic, thus opening up a vast new field of human knowledge, and highlighting the ability of humans to gain knowledge about their physical environment.²⁷ Scholars have tied this new-found validity of human experience to the growing number of treatises on the topic of optics during the thirteenth century.²⁸ For example, Roger Bacon's thirteenth-century treatise *Opus maior* discusses optics and the importance for artists of understanding the geometry which lies at the heart of naturalistic image-making, a sentiment alluded to earlier in the century by Robert Grosseteste.²⁹

Parallel to these developments in intellectual culture, the twelfth century was also marked by an artistic transition from Romanesque to Gothic style. One of the most active fields in regard to examining Romanesque images concerns the reception of images by contemporaries and the medieval idea of visuality. On various medieval attitudes to visuality, Cynthia Hahn writes 'They range from the insistence on the 'eye of the mind' and lowered eyes in early medieval work, to the wary use of the visual, to the culturally determined 'gaze' and a

²⁶ Charles Burnett, 'Adelard of Bath and the Arabs', in J. Hamesse and M. Fattori (eds.), *Recontres de cultures dans la philosophie médiévale* (Louvain-la-Neuve and Cassino, 1990), pp. 89-107. Adelard writes, '*De animalibus difficilis est mea tecum dissertio. Ego enim aliud a magistris Arabicis ratione duce didici, tu vero aliud auctoritatis pictura captus capistrum sequeris.*' Adelard Of Bath, 'Die Quaestiones naturales des Adelardus von Bath', edited by Martin Müller, *Beiträge zur Geschichte der Philosophie und Theologie des Mittelalters*, 31 (Münster, 1934), p. 11.

²⁷ Menso Folkerts, 'Adelard's Versions of Euclid's *Elements*', in Charles Burnett (ed.), *Adelard of Bath: an English Scientist and Arabist of the Early Twelfth Century* (London, 1987), pp. 55-68.

²⁸ C.f. Robert Grosseteste, 'Concerning Lines, Angles, and Figures', in Edward Grant (ed.), *A Source Book in Medieval Science* (Cambridge, Mass, 1974), p. 385. This view is somewhat disputed by Madeline Caviness, who does not doubt the importance of the new translations of Arabic scientific treatises and Aristotle, but highlights the fluctuating influence of them over the entire Gothic period: Madeline H. Caviness, 'The Simple Perception of Matter and the Representation of Narrative, ca. 1180-1280', *Gesta*, 30 (1991), pp. 48-64. For more information about the influence of Arabic sciences on Latin writers in the twelfth century see, Burnett, 'Adelard', p. 90. Also, Ian P. Wei, *Intellectual Culture in Medieval Paris: Theologians and the University, c.1100-1330* (Cambridge, 2012), p. 39.

²⁹ Overview of medieval optics found in, G. ten Doesschate, 'Oxford and the Revival of Optics in the Thirteenth Century', *Vision Research*, 1 (1962), pp. 313-342.

full confidence in the epistemological potential of physical sight in the later Middle Ages.³⁰

Hahn's work highlights the spectrum of 'visualities' which accompany the medieval image. I will focus on how such approaches to medieval visuality affect our understanding of architectural representations.

One example of this is the question of the relation between the part and the whole. Samuel Edgerton argues that, 'unlike the Renaissance painter depicting his scene in perspective, the medieval artist viewed his world quite subjectively. He saw each element in his composition separately and independently, and thus paid little attention to anything in the way of a systematic spatial relationship between objects.'³¹ Edgerton's objective is to differentiate between modern and pre-modern modes of seeing and of representing space. In this view, medieval visuality is inherently mediated by the subject's act of observation, which loses objectivity when depicting space and objects within that space. Edgerton describes a constructive framework for indicating this type of visuality, namely that the elements within an image have been broken down into their constituent parts. Meyer Schapiro reinforces this framework, writing, 'The Romanesque artist thought it better to individualize the parts, regardless of their functional identity.'³² Here Schapiro refers to the tendency of some Romanesque artists to juxtapose elements regardless of their placement in the physical world. The same emphasis on the individual parts of architecture has also been pointed out by Charles Radding and William Clark: '[the] conception of space as composed of discrete, repetitive units defined by carefully delineated boundaries and organized into additive sequences is central

³⁰ Cynthia Hahn, 'Vision', in Conrad Rudolph (ed.), *A Companion to Medieval Art: Romanesque and Gothic in Northern Europe* (Oxford, 2006), pp. 44-64, here p. 45.

³¹ Samuel Y. Edgerton, *The Renaissance Rediscovery of Linear Perspective* (New York, 1975), p21; repeated in William V. Dunning, *Changing Images of Pictorial Space: A History of Spatial Illusion in Painting* (Syracuse, 1981), p. 12; See also, Suzannah Biernoff, *Sight and Embodiment in the Middle Ages* (New York, 2002), p. 9.

³² Meyer Schapiro, *Romanesque Art: Selected Papers, Volume One* (London, 1977), p. 4.

to late eleventh- and early twelfth-century architecture.³³ Architecture, defined as a group of juxtaposed individualised elements, fits well with Edgerton's concept of individualization in images of the period, and offers an excellent starting point to create a framework in which to interpret Romanesque architectural drawings. Examples of this type of representation will be provided at the end of this introduction, specifically in regard to eleventh-century images.

As mentioned, Edgerton is concerned only with distinguishing between 'modern' and 'pre-modern' modes of depicting nature, which means his discussion of the medieval period lacks precision. However, by examining Villard's portfolio in light of Edgerton's thesis of Romanesque representations, both the portfolio, and Robert Branner's highlighting of its unprecedented architectural imagery, begin to make sense. Villard's work provides an important waypoint towards the linear perspective of the fifteenth century, and its precursors in the previous century, and helps to define a peculiarly Gothic frame of reference. Gothic's concern is for the entirety of a structure, as demonstrated in Villard's work, and contrasts with the Romanesque image's focus on the elements which construct a structure; allowing us to draw a line between Gothic and Romanesque forms of visuality, especially in terms of architectural representation.

I have referred to 'Romanesque' and 'Gothic' works, but the identification of images – especially architectural images – in this manner is problematic. There is no complete description of a conceptual framework in which to place Romanesque drawings of architecture; indeed many definitions of the term Romanesque are notoriously unclear.³⁴ For the most part

³³ Charles Radding, William W., Clark, *Medieval Architecture, Medieval Learning: Builders and Masters in the Age of Romanesque and Gothic* (New Haven; London, 1992), p. 44. The chronological limits Radding and Clark impose rely on their definition of Romanesque.

³⁴ Definitions of Romanesque are varied, with the majority of scholarly works focused on contrasting the style associated with art produced in the Christian West during 1050-1150 with the later Gothic style. Andreas Petzold, *Romanesque Art* (London, 1995), p. 9; George Zarnecki, *Romanesque Art* (London, 1971), p. 5. There is a historiography of the term in Tadhg O'Keefe, *Romanesque and Pan-European Architecture* (London. 2007), pp. 26-44.

it is defined by its difference from Gothic drawings, which takes into account Romanesque's reluctance towards naturalism, and a tendency to emphasise the 'essentially flat, abstract, decorative qualities' of art.³⁵ This flatness and inability, or choice, not to depict an environment in a naturalistic manner is problematic; a problem which comes to the fore when the modern viewer interprets Romanesque architectural imagery. The primary obstacle encountered when looking at images from this period is implicitly stated by Heinrich Wölfflin: 'It is wrong to believe that a medieval picture was ever looked at with our concepts of illusionistic effects.'³⁶ The climax of these illusionistic effects arrives during the fifteenth century with the re-discovery of linear perspective. The technique is founded on the creation of orthogonal lines which converge upon a vanishing point within the scene. The orthogonal lines seem to recede into the picture plane, creating the illusion of three-dimensional space. The technique was perhaps known in the Graeco-Roman world, although this is not certain.³⁷ It was fully described by Leon Alberti in *On Painting*, but the technique was publically demonstrated before Alberti's work by Brunelleschi in Florence.³⁸ The fifteenth-century 'discovery' of linear perspective implies that previous attempts to depict pictorial space cannot have included linear perspective in their creation. The alternative mode of visibility which underlies Romanesque imagery contrasts with the post-Romanesque expectations of naturalism, which causes problems of interpretation. Wölfflin's comment demonstrates that it would be a teleological fallacy to expect Romanesque architectural representations to accurately reflect space; they must be interpreted differently from later drawings.

³⁵ George Zarnecki, *Romanesque Art* (London, 1971), p. 12.

³⁶ Heinrich Wölfflin, *Classic Art: An Introduction to the Italian Renaissance* (Oxford, 1986), p. 4.

³⁷ Dunning, *Changing Images*, p. 5.

³⁸ Cf. Leon Battista Alberti, *On Painting* (Cambridge, 2011), pp. 54-59.

For example, Miriam Bunim has traced the representation of space in late antique and medieval scenes, highlighting the dramatic limitation of space in medieval examples where the picture plane and vertical axis become emphasised by artists.³⁹ The effect means space becomes 'telescoped,' flattened through its simplistic representation as two horizontal bands of colour – blue for the sky, and various colours for the ground on which the figures walk. Bunim offers the ninth-century mosaics at Santa Prassede in Rome as an example. Here, 'the component parts of the representative background have been reduced to the simple form of two banks of unequal colour.'⁴⁰ The artist indicates a type of setting, but not the space in which the figures are placed. Architecture, in particular, suffers from this change and newly found focus: 'In architectural objects the horizontal courses of the building are stressed. Projections of the facade are indicated by inclined lines in the upper part of the construction, thus, buildings become stylised and lose any sense of naturalism they may have had, in much the same manner as the overall representation of space in late antiquity.'⁴¹ Architectural depictions were not checked against the buildings surrounding the artist, but were, instead copied from a pictorial exemplar, and in the process some elements were misunderstood.⁴²

If naturalism was not, or could not, have been an overriding concern for Romanesque artists, what characteristics do drawings from the period share which would allow us to bring architectural imagery within a comprehensive framework? Paul Lampl has attempted to group early medieval architectural images under five types: front-view, two-sided view, three-sided view, the conventional perspective, and the 'split edifice.'⁴³ The front-view depicts only the facade of a building, the two-sided view illustrates two full sides of a building which are joined

³⁹ Miriam Schild Bunim, *Space in Medieval Painting and the Forerunners of Perspective* (New York, 1940).

⁴⁰ *Ibid.*, p. 44.

⁴¹ *Ibid.*, p. 53.

⁴² *Ibid.*

⁴³ Paul Lampl, 'Schemes of Architectural Representation in Early Medieval Art', *Marsyas*, 9 (1961), pp. 6-12.

together, the three-sided view flattens the building to create three facades, the conventional perspective uses diagonal lines to create perspectival illusion, and the split edifice cuts the building along the ridge-line, expanding it outwards.⁴⁴ Lampl's organisation of the images is useful because it illustrates the relative freedom an artist had when drawing architecture, unencumbered by naturalism. However, Lampl's work tells us very little about why and how the drawings appear the way they do. His description shows us that two-dimensional representations of buildings could be broken up and reassembled at the pleasure of the artist. Lampl, however, never discusses any possible underlying intellectual framework which may inform architectural representations of the period.

This thesis agrees with Cynthia Hahn's final description of medieval visuality, when there was 'full confidence in the epistemological potential of physical sight in the later Middle Ages,' and that the 'apt mental image [...] can bring awareness or experience into focus.'⁴⁵ This 'confidence' demonstrates that intellectual and material culture existed within a nexus wherein medieval images form an epistemological tool that allowed the author to express, and the reader to understand, facets of the world around them. Architectural representations have been studied within the fields of architectural history, literature, and art history.⁴⁶ However, despite Hahn's reference to the relationship between visuality and epistemology, architectural representations have rarely been studied in relation to intellectual history or the history of education. In one famous study of Gothic architecture, it was argued that monastic or other forms of education played an important role in the development of both architecture and artistic development as a whole. This work, by Erwin Panofsky, rejects Viollet-le-Duc's theory

⁴⁴ A series of examples appears in Lampl's essay.

⁴⁵ Hahn, 'Vision', pp. 45 and 47.

⁴⁶ Two studies which have examined architecture in the context of medieval literature are, Christiania Whitehead, *Castles of the Mind: A Study of Medieval Architectural Allegory* (Cardiff, 2003); Abigail Wheatley, *The Idea of the Castle in Medieval England* (Woodbridge, 2004).

of structural rationalism and instead considers the influence of intellectual culture on architecture forms.⁴⁷ In doing so, Panofsky attempts to move the rationale for Gothic forms away from a mere utilitarian functionality and attempts to link the emergence of Gothic architecture with the twelfth-century's vibrant intellectual life. In his controversial lecture *Gothic Architecture and Scholasticism*, Panofsky stated, 'in the period between about 1130-40 and about 1270, we can observe, it seems to me, a connection between Gothic art and Scholasticism which is more concrete than a mere "parallelism" and yet more general than those individual (and very important) "influences" which are inevitably exerted on painters, sculptors, or architects by erudite advisers.'⁴⁸ Panofsky argues that the development of philosophical scholasticism in medieval schools reflects changes in how artists and workers conceptualised artistic output. He compared the structures of these outputs to theological *summae* which were large treatises offering a complete system of knowledge.⁴⁹ In this genre Panofsky identified three characteristics, 'sufficient enumeration' (concerned with totality), 'sufficient articulation' (concerned with the systematic layout of arguments), and 'sufficient interrelation' (concerned with the internal cogency of the argument). These three characteristics are reflected in Gothic cultural products in a distinct way which marks them as different from preceding and subsequent periods.

Panofsky's argument was rejected by later scholars, not least Peter Kidson, who accuses Panofsky of 'twisting history to prove his point,' and of being, at times, 'silly.'⁵⁰ In his robust attack on Panofsky's thesis, Kidson's main point is that 'it ought to be obvious to art historians, if to no one else, that patrons, even the most enlightened and exigent among them, do not

⁴⁷ Erwin Panofsky, *Gothic Architecture and Scholasticism* (Latrobe, Penn., 1951).

⁴⁸ Ibid., p. 20.

⁴⁹ Panofsky emphasises the role of the entire building in Gothic architecture, and not the individualised approach indicative of Romanesque art, which is described in detail below.

⁵⁰ Peter Kidson, 'Panofsky, Suger and St Denis', *JWCI*, 50 (1987), pp. 1-17, here p. 2.

normally invent styles.⁵¹ In essence, the learned monks and canons are not usually concerned with the creation of artistic styles, and hence any association between monastic knowledge and the practical application of it is indirect, if it exists at all. Kidson is concerned primarily with limiting Abbot Suger's influence on the renovations of the abbey church of Saint Denis at the end of the 1130s, but his point still stands.⁵² Kidson's argument correctly limits Panofsky's conclusions; however, Kidson may go too far. Patrons may not 'invent styles,' but they did experience and no doubt had opinions about the forms of architecture around them; they also would have seen architectural representations in manuscripts. The drawings under discussion in this thesis are not rarefied examples, but exist in a relatively large number of manuscripts; so much so it would seem that architectural representations formed a regular part of the teaching and learning experience in the twelfth century. Kidson argues that it is possible to see that monks or canons relied on the particular skills of architects or masons, they each possessed particular skills at erecting architecture.⁵³ However, the large number of drawings of architecture in manuscripts indicates that the monk or canon was aware of architecture and architectural drawings in some form or another.

Radding and Clark describe the cleft between architectural and intellectual cultures succinctly: 'The attempt to draw innovations in the field of architecture in line with those in philosophy and education is tempting, but problematic.'⁵⁴ The authors try to overcome this problem by pointing out that the late twelfth- and thirteenth-century development of philosophy and art can be linked to architecture via the processes which underlie them both,

⁵¹ Ibid., p. 1.

⁵² Abbot Suger described the renovations of the royal abbey church of Saint Denis in the mid-twelfth century, the work is considered to be the first recognisable manifestation of the Gothic style in architecture. The subject is considered in more detail, pp. 89-90..

⁵³ Kidson, 'Panofsky', pp. 1-2. Here Kidson points out that even the strongest of patrons still requires an 'artistic imagination' to translate inspiration into reality.

⁵⁴ Radding and Clark, *Medieval Architecture*, p. 1.

namely, 'philosophers and builders developed methods for solving new problems.'⁵⁵ This new approach draws on treatises on the liberal arts, and the tools with which they equipped the scholar. The texts on the liberal arts are taken as 'springboards' to further questions, and not, as had previously been the case, taken as implicitly correct statements of fact.⁵⁶ Their thesis is fascinating, and especially worth highlighting here because of its use of the liberal arts in drawing parallels with architecture. However, it is not without problems. Radding and Clark analyse this broader, more dynamic application of the liberal arts to the 'mental processes' of medieval problem solving, but only in relation to the trivium subjects, with little mention of the quadrivium. Moreover, Radding and Clark's focus on the liberal arts is not universally accepted in its current form. For example, Faith Wallis points out the applied sciences of the quadrivium appear in very different texts to abstract philosophical treatises on the liberal arts.⁵⁷ However, as we will see, both quadrivial and philosophical works use architectural representations to frame their data, drawing them together as a legitimate subject of study.

Wider discussions regarding the relationship between material and intellectual cultures have taken place, discussions which have broadened the definition of material culture to include archaeological material.⁵⁸ Colin Renfrew goes as far as to state that, 'without artefacts, material goods, many forms of thought simply could not have developed.'⁵⁹ According to this view, the interaction between people and the world around them necessarily influences how cognitive processes are structured. As we will see, when it comes to structuring information

⁵⁵ Ibid., p. 4.

⁵⁶ Ibid., p. 30.

⁵⁷ Bede, *The Reckoning of Time*, trans. Faith Wallis (Liverpool, 2004), p. xx.

⁵⁸ Colin Renfrew, 'Cognitive Archaeology: Some Thoughts on the Archaeology of Thought', *Cambridge Archaeological Journal*, 3 (1993), pp. 248-250; another archaeologically based approach attempts to discern representations of material culture in medieval manuscripts, M. O. H. Carver, 'Contemporary Artefacts Illustrated in Late Saxon Manuscripts', *Archaeologia*, 108 (1986), pp. 117-145.

⁵⁹ Colin Renfrew, 'Mind and Matter: Cognitive Archaeology and External Symbol Storage', *Cognition and Material Culture: the Archaeology of Symbolic Storage* (Oxford, 1998), pp. 1-6.

in the Middle Ages, especially in didactic works, architecture was used frequently. But our question here is why architecture in particular became associated with particular types of texts. A specific example of how this is manifest in the twelfth century is in Hugh of Saint Victor's (d. 1141) use of objects such as Noah's Ark to discuss complicated theological structures.⁶⁰ While the details of this will be discussed during the thesis, for now it is enough to note that material culture has been acknowledged to have an effect on intellectual culture.

We have established that Romanesque architectural representations were not depicted in a naturalistic manner, and that an artist had relative freedom to depict structures to suit particular needs. We have also seen that architecture, and material culture more widely, have impacted upon discussions of medieval intellectual cultures. It remains to be seen how the methods of Romanesque architectural representations impacted upon a particular example of intellectual culture. Now I will briefly provide a case-study to demonstrate how architectural representations were sometimes used to sort datasets. It exemplifies the interplay between the text and the image which was used to communicate the underlying point of the text to the reader. By presenting this example, several objectives are fulfilled; the presence of architectural images in liberal arts texts is established; the hierarchical forms of the representations become apparent; and it serves to illustrate the use of architecturally influenced text and images to explain abstract subjects. No conclusions are drawn from this case-study; it only highlights the question this thesis asks: why does architecture appear in twelfth-century didactic texts? The case study considers early medieval textbooks of logic.

⁶⁰ Conrad Rudolph states the most direct influence of philosophy on architecture when he refers to Hugh of Saint Victor as a sort of 'consultant' on the rebuilding of St. Denis, but he does not give any indication of why the relationship can be described so directly. Conrad Rudolph, *Artistic Change at St-Denis: Abbot Suger's Program and the Early Twelfth-Century Controversy over Art* (Princeton, 1990), pp. 36-47. Rudolph extends this thesis in his latest work on the subject, by arguing that the Hugh of Saint Victor also informed the composition of Saint Denis' west facade, Conrad Rudolph, *The Mystic Ark: Hugh of Saint Victor, Art, and Thought in the Twelfth Century* (New York, 2014), pp. 364-374. Hugh's works will be discussed in detail in chapter two, pp. 160-163.

Boethius' (d. 524) work *De divisione* is a text on logic which considers the importance of separating objects and ideas into a hierarchy, allowing for a clear understanding of the subject under discussion. Ultimately the purpose of this paradigm is to define the world around the subject. For example, Boethius goes through the manner of placing the term 'name' in a correct series of relationships between genus and species. He eventually arrives at the description, 'a name is a spoken sound significative by convention, without tense, no part of which is independently significative when separated.'⁶¹

For our purposes, it is important to note that the use of a hierarchical arrangement for any material is reflected in the use of architectural images to explain particular aspects. For example, Boethius defines two types of division: *secundum se* and *secundum accidens*. These two categories can be further divided into three divisions each, making six in total. Here we are concerned with the first, *secundum se*. This type is made of three further types: *genus in species*, *totus in partis*, and *vox in significationes*. These three types of *secundum se* describe various ways in which the genus and the species relate. More specifically Boethius describes the *totus in partis* as, *ut cum dico domus aliud esse tectum, aliud parietes, aliud fundamenta*.⁶² We can note that Boethius uses architectural imagery – foundations, a house, a roof, and walls – as a way to conceptualise a particular relationship between a parent object and a child element, using the parts of a building to clarify the image. He elaborates on this by stating that one of the unique characteristics of this type of *secundum se* is the independence of the child element from its parents. He writes: 'the parts constituting a whole substance are separable in actuality or conceptually and in thought.'⁶³ In essence, the *totus in partis species* elements can exist independently without the genus, 'for example, if someone removes the

⁶¹ Boethius, *Anicii Manlii Severini Boethii De Divisione Liber*, trans. John Magee (Leiden, 1998), p. 37.

⁶² 'such when I say that a house is some roof, some walls, or some foundations.' Ibid., pp. 8-9.

⁶³ Ibid., pp. 12-13.

roof from a house that is complete he destroys the continuity of the whole that existed before; but even though the whole perishes, the walls and foundation will continue to exist.’⁶⁴ In this case Boethius uses architecture to form the conceptual basis for the description of the interpretation of the world and abstract elements.⁶⁵

Underlining this use of architecture as a metaphor are the architectural representations which sometimes appear alongside Boethian texts in manuscripts from the tenth to the twelfth centuries. In at least three of the manuscripts used by John Magee in his edition of *De divisione* there are tabular architectural diagrams accompanying various texts. For example, Paris, BnF, MS lat. 6400E contains a collection of Boethian texts, including *De interpretatione*, *De hypotheticis syllogismis*, *De divisione*, and *De definitione*.⁶⁶ On f. 27v (fig. 4) a double arcade contains a list of names and objects. It establishes a binary relationship between the left and right arcade, declaring one object is, and another is not. The associated text forms part of Boethius’ *De interpretatione*. In other sections, simple grid diagrams are used for similar purposes; it is unclear why the copyist used architectural tables at this point. Further on, at f. 43v (fig. 5), there is another set of smaller double arcades. Just as in the previous example, this one also creates similar binary relationships between what is possible/contingent and impossible/necessary.⁶⁷ The appearance of architecture in these Boethian manuscripts, and the hierarchical description of the world within them, implies a relatively strong connection

⁶⁴ Ibid., p. 15.

⁶⁵ Boethius also uses the example of the human body, dividing it into hands, feet, and fingers; however, architecture forms the primary example.

⁶⁶ The BnF catalogue lists this as a thirteenth-century manuscript, however, Magee suggests states it is a twelfth-century copy. The lack of Gothic characteristic in the script suggests that Magee is correct, Boethius, *De Divisione*, p. lxvi.

⁶⁷ There are a number of diagram types which fulfil the same function, for example, ‘squares of opposition’, which are commonly associated with texts on logic, cf. John E. Murdoch, *Album of Science: Antiquity and the Middle Ages* (New York, 1984), p. 62.

between the depiction of architecture and the foundational educational texts, the *ars vetus*, of the Romanesque period.

The inclusion of architectural tables is unusual from a modern perspective, where it may seem the decorative elements would detract from the seriousness of the subject. It brings to mind Bernard of Clairvaux's well-known *apologia* concerned with medieval art, where he argues that any decoration may affect a monk's concentration. Bernard writes, 'In short, everywhere so plentiful and astonishing a variety of contradictory forms is seen that one would rather read in the marble than in books, and spend the whole day wondering at every single one of them than in meditating on the law of God.'⁶⁸ While Bernard's concern is for the distraction caused by sculpture in cloisters, it has been taken as somewhat indicative of a medieval commentary on aesthetics more widely.⁶⁹ This thesis contends that many architectural representations are not distractions, as Bernard may argue, but in fact represent a didactic technique alongside any accompanying text. Their inclusion and function in this regard is far more sophisticated than the casual modern reader might recognise.

'No aspect of human society, past or present, can be studied in a satisfactory way without taking account of the cognitive dimension – of what people thought, as well as what they did.'⁷⁰ Renfrew's description of the cognitive dimension partly gives rise to part of the methodology underscoring this thesis, one focused on dimensionality. In the early Middle Ages a dimension was interpreted as a measurement of some sort which could be taken from a real object or something more abstract.⁷¹ Measurements of length, width, height, and time

⁶⁸ Conrad Rudolph, *The 'Things of Greater Importance': Bernard of Clairvaux's Apologia and the Medieval Attitude Toward Art* (Philadelphia, 1990), p. 12.

⁶⁹ Umberto Eco, *Art and Beauty in the Middle Ages*, trans. Hugh Bredin (New Haven; London, 1986), pp. 7-8.

⁷⁰ Renfrew, 'Cognitive Archaeology', p. 247.

⁷¹ Mary Gratia Ennis, 'The vocabulary of the *Institutiones* of Cassiodorus; with special advertence to the technical terminology and its sources' (Unpublished PhD dissertation, Catholic University of America, 1937), pp. 112 and 115.

combine to form two, three or four dimensions, and these combinations will be used as a basis for discussing architectural imagery in this thesis. Architecture is inherently considered in terms of its dimensionality; its length, width, and height combine to form a structure, and any building lacking in one of these dimensions is no longer a building. The structure of the thesis moves from two, three, and four dimensions of architecture, comprising three chapters in total. At the beginning of each chapter I explain how each set of drawings and architectural imagery fits into a particular dimensional category. This is not to say that each example I provide falls into a strict typological category: I do not argue, for example, that Richard of Saint Victor's work is only three-dimensional in focus. While the identification of the drawings' dimensional nature is not objective, in this sense, it is certainly not arbitrary. Textual material, discussed individually, provides evidence for the proposed methodology. If this thesis questions the circumstances in which architecture was thought to be useful for structuring thought we must first acknowledge that circumstances change from text to text. To accommodate this dynamic it seemed fruitful to use a dimensional framework to provide an arena for our sources. If our evidence is a constellation of evidence, the dimensional framework is the telescope through which we view that evidence and bring it into focus.

The first chapter of this thesis continues discussing the appearance of architectural representations similar to those which appear in Boethius' works on logic. Specifically, it examines the appearance of very similar representations in works concerned with the quadrivium, works which lay out numerical datasets within architectural frameworks. The surprising frequency of arcades raises the question of why they were used, what is it about architecture in particular which allows it to be included in mathematical works? The chapter discusses the Eusebian canon tables, which form one of the most consistent and stable examples of architectural representation from the early Middle Ages through to the twelfth

century. Such representations appear very similar to the Boethius representations discussed above, and many others. Many texts which include the arcades make reference to the length and width of tables, which are thus identified as two-dimensional architectural representations, a facet of their design which will be discussed in detail by examining the language associated with the drawings.

The second chapter incorporates the dimension of height, or depth, into architectural representations, thus moving to three-dimensional architectural representations. This is most apparent in Richard of Saint Victor's commentary on the Book of Ezekiel, called *In visionem Ezechielis*. The nature of the commentary means Richard has no choice but to discuss architecture, but this chapter asks why Richard chose to include a series of plans and elevations with his commentary. Furthermore, the chapter reiterates the main research question of the thesis by asking how Richard came to draw the plans and elevations, and what that might tell us about twelfth-century representations of three-dimensional structures. I argue that Richard's painstaking attention to the provision of highly accurate dimensions for various structures demonstrates his desire to interpret Ezekiel's vision as a historically real event. This can be best achieved by providing a complete three-dimensional picture of the buildings in Ezekiel's vision, transforming the textual material into corporeal objects in the process.

The third chapter moves away from visual representations of architecture and focuses on Honorius Augustodunensis' work, the *Gemma animae*. In this work Honorius identifies different parts of the medieval church and through a process similar to typological exegesis links specific architectural elements with different people, events, and objects from Christian history. This chapter considers why Honorius used the medieval church building as a focus for teaching Christian history; the chapter complements the previous two by questioning the role of textual descriptions of architecture and why and – in the case of Honorius' work – how it

was incorporated into an educational context. The medieval church building, as one manifestation of material culture, is a consistent form throughout the Latin west; most contain an altar, chancel, and nave, along with the necessary liturgical objects. These architectural elements and objects provide a tangible anchor for Honorius' readers to associate their environment with contemporary intellectual culture. The inclusion of time, in its typological sense, provides the basis for assigning Honorius work as an example of four-dimensional architecture.

The three chapters are arranged to best answer the central research questions of the thesis, namely how and why architectural representations were incorporated into twelfth-century didactic texts. By describing the dimensional properties of the drawings and texts we will see that there is no simple answer to these questions; architectural representations performed several roles; for example, they were used to index information; with the aid of geometry they were used to represent three-dimensional structures; and they were used to teach history through the typological qualities of medieval church architecture. Architecture was a versatile form, but it is possible to draw together important examples to demonstrate that the visual and tangible nature of architecture was used in different ways by various authors.

The texts and manuscripts in this thesis are chosen because they best illustrate the relationship between the texts and images we seek to explore. In many of the manuscripts I have chosen there are references to accompanying diagrams and figures; the language of those references are key to understanding the nature and purpose of the architectural figures. My approach is to examine both word and image to gather insight into the architectural drawings in quadrivial manuscripts. There are other examples of architectural representations in twelfth-century manuscripts that may have appeared in this thesis, but in many cases there

is no clearly associated text which might cast light on the presence of architectural imagery. the lack of consistent references to architectural figures in some manuscripts means they were not included for discussion, although they still may be worth further investigation outside the context of this thesis. The large number of architectural images in medieval manuscripts means it will not be possible to refer to or mention every single example. Indeed, creating an exhaustive catalogue of these images would not necessarily be helpful in understanding why architecture was such a prevalent subject. Although I will consider why architecture appears in particular types of texts, any conclusion does not claim to apply to every representation from the Middle Ages, or even from the twelfth century. Instead it possible to demonstrate the pedagogic importance of architectural imagery in the three case studies provided, and it may be possible to extract conclusions made about them to other examples; however, this thesis makes no explicit claim that this is indeed possible.

Before moving to the first chapter, it is important to provide some context to the range of architectural drawings discussed in all three chapters. This introduction has outlined the theory of medieval visuality and its application to architectural drawings; now specific examples are offered. As mentioned above, there are no modern scholarly works which outline architectural representations from the early Middle Ages (i.e., those from before the thirteenth century). To that end, the rest of this introduction enumerates the most important examples of architectural drawings which appear before the twelfth century; that is before the beginning of the thesis' chronological focus. In doing so, it will become clear that the attempt to identify the proto-history of technical drawing is only one possible approach to the representations. By collecting together architectural drawings completed prior to the twelfth century in one place, several facets of their development becomes apparent: they were completed in monastic centres; they accompany texts to clarify obscure parts of the text, and they are not

drawn with the structural integrity of buildings in mind.⁷² Each of these developments echo ideas found throughout this thesis.

Architectural Representations Prior to the Twelfth Century

As highlighted above, many studies of architectural drawings attempt to trace the development of conventions in technical drawing practice, however, there are so few drawings from the early Middle Ages that this task becomes nearly impossible.⁷³ As a result, there have been no attempts to consider architectural representations from the early Middle Ages in one place. Having this knowledge to hand forms an important contextualising act in this study.

There are some studies which briefly discuss early architectural representations, but many are concerned with linking the drawings with later developments in the genre, and not with examining the intellectual culture in which they were created. For example, Horn and Born's extensive commentary on the Saint Gall plan, a drawing discussed below, provides illustrations of several early medieval drawings.⁷⁴ The authors' objective in presenting these drawings is to draw parallels between formal aspects of the Saint Gall plan and earlier representational practice. Adomnan's plans for his work, *De locis sanctis*, also discussed below, are mentioned in works concerned with the history of topography, where scholars posit a link between ancient Roman surveying techniques and early medieval drawings.⁷⁵ Again, these

⁷² Some of these observations may seem obvious, but I have thought it important to enumerate them for the simple reason that they are not written down elsewhere.

⁷³ Robert Branner argues that the drawings of the period are too 'representational' to be considered as technical drawings, especially when compared to drawings from the Gothic period: Branner, 'Villard de Honnecourt', p. 129.

⁷⁴ Walter Horn, Ernest Born, *The Plan of St. Gall* (3 vols., Berkeley, 1979).

⁷⁵ P.D.A. Harvey, *Medieval Maps* (London, 1991), pp. 12-13; P.D.A. Harvey, *The History of Topographical Maps: Symbols, Pictures and Surveys* (London, 1980), pp. 131-2. Adomnan's plans are also discussed in Catherine Delano-Smith, Roger J.P. Kain, *English Maps: A History* (London, 1999), p. 10, where they are incorrectly described as 'drawn with regard to correct proportion.'

discussions provide only a context for later developments of cartography, acting as a link between antiquity and the later Middle Ages. None of these studies speculate on or extensively investigate the immediate intellectual environment of the drawings.⁷⁶ I will not discuss the representations in this section in great detail because they form only the context to my argument, the examples provide only an outline of how architecture was represented in the period prior to the main focus of this thesis. Before examining drawings from the early Middle Ages it is important to note that no discussion of medieval architectural representations would be complete without first acknowledging that architectural drawings existed before the Middle Ages began. Before the beginning of the Christian period Vitruvius' *De architectura* provided a detailed account of the education and responsibilities of the architect in antiquity. The text refers to architectural drawings, and was known throughout the Middle Ages.

Vitruvius

It is possible to establish the existence of technical architectural drawings in antiquity. 'Vitruvius may not have been a very distinguished architectural practitioner, but his ten books on architecture, written during the first century before Christ, are the fundamental source of architectural theory [...].'⁷⁷ Vitruvius (c. 75 B.C. - c. 15 B.C.) was an architect and author of *De architectura*.⁷⁸ The text of *De architectura* offers an extended discussion of the education of an architect, a description of buildings and their details, as well as a section on weapons of

⁷⁶ The important exception to this is Thomas O'Loughlin's brief study of the plan of the Heavenly Jerusalem placed at the end of the Book of Revelation in the ninth-century Book of Armagh, Thomas O'Loughlin, 'The Plan of the New Jerusalem in the Book of Armagh', *Cambrian Medieval Celtic Studies*, 39 (2000), pp. 23-38. O'Loughlin highlights the exegetical nature of the drawing, and that it was possibly based on an earlier model. See also, Thomas O'Loughlin, *Celtic Theology: Humanity, World and God in Early Irish Writings* (London, 2000), p. 188.

⁷⁷ Michael Asselmeyer, 'Response to an Education Minister Who Regards History as Irrelevant', *Architectural Research Quarterly*, 7 (2003), p. 10-11.

⁷⁸ Translations from *De architectura* are taken from Vitruvius, *Vitruvius on Architecture*, trans. Frank Granger (2 vols., Cambridge, Mass., 1989). Any exceptions to this will be noted.

war. No architectural drawings survive from Vitruvius' works, however it is likely that some drawings were originally associated with the text, and Vitruvius very clearly describes the existence of technical drawings.⁷⁹ There are no extant architectural treatises between *De architectura* and Alberti's fifteenth-century treatise *Ten Books on Architecture*, for that reason the medieval history of architectural drawing must begin with Vitruvius' text. The Vitruvian text was popular throughout the Middle Ages, and was certainly known during the Carolingian period.⁸⁰ Manuscripts were present at many prominent medieval libraries, and there are direct and indirect references to it by many different authors from a variety of places.⁸¹

It is important to recognise that prior to the Middle Ages there was a system for representing architecture, which seems to have been subsequently lost. In a sense, architectural representations were not created *ex nihilo*, but arose out of the Roman architect's training, which may be hinted at in examples from the Middle Ages. Vitruvius discusses the education of the architect in the first book of *De architectura*. He pleads for him to be well versed, although not expert, in many different disciplines.⁸² Importantly for this thesis, Vitruvius describes the types of architectural drawings in which one first lays down the appearance of the proposed structure.

Dispositio autem est rerum apta conlocatio elegansque compositionibus effectus operis cum qualitate. species dispositionis, quae graece dicuntur ἰδέαι, sunt hae: ichnographia, orthographia, scaenographia. ichnographia est circini regulaeque modice continens usus, e qua capiuntur formarum in solis arearum descriptiones. orthographia autem est erecta

⁷⁹ 'I have decided at the end of the book to furnish two plans, or as the Greeks say *schemata*.' Vitruvius, *Architectura*, I. 6., pp. 62-63. Also see, Gustina Scaglia, 'A Translation of Vitruvius and Copies of Late Antique Drawings in Buonaccorso Ghiberti's Zibaldone', *Transactions of the American Philosophical Society*, 69 (1979), pp. 1-30.

⁸⁰ A letter from the period seeks clarification for the Vitruvian term *scaenographia*, indicating it must have been known to both parties. C. Davis-Weyer, *Early Medieval Art: 300-1150* (Toronto, 1986), pp. 107-108.

⁸¹ C.H. Krinsky, 'Seventy-Eight Vitruvius Manuscripts', *JWCI*, 30 (1967), pp. 36-70.

⁸² Vitruvius, *Architectura*, I. i. pp. 7-25.

*frontis imago modiceque picta rationibus operis futuri figura. item scaenographia est frontis et laterum abscedentium adumbratio ad circinique centrum omnium linearum responsus. hae nascuntur ex cogitatione et inventio.*⁸³

In this passage Vitruvius divides architectural drawing into three formats: plan (*ichnographia*), elevation (*orthographia*) and drawings in perspective (*scaenographia*). He does not devise these formats, but simply describes contemporary practice. Vitruvius goes to great lengths to point out that his treatise is unique within a Latin context, but not Greek one.⁸⁴ The terms used for the formats certainly imply a Greek origin. The term γραφία has a root in the verb γραφω, meaning to 'scratch,' or 'draw;' much of the terminology Vitruvius uses has a Greek cognate. While this thesis is not so much concerned with the history of technical drawings, Vitruvius' work speaks to one of the main questions addressed, namely, how drawings were represented.

Ichnographia refers to the plan format, where the building is depicted from above showing the structure's footprint upon the ground. Modern practice describes the plan as when 'a horizontal plane cuts through the buildings so as to remove that part of the building above the cutting plane.'⁸⁵ The overall effect is one which illustrates the base of the structure's walls, as well as doorways and windows, if their lowest point is set below the horizontal plane. While various figures are referred to throughout *De architectura*, none have survived from

⁸³ 'Arrangement, however, is the fit assemblage of details, and, arising from the assemblage, the elegant effect of the work and its dimensions, along with a certain quality of character. The kinds of arrangement (which in Greek are called *ideae*) are these: ichnography (plan); orthography (elevation); scenography (perspective). Ichnography (plan) demands the competent use of compass and rule; by these plans are laid out upon the sites provided. Orthography (elevation), however, is the vertical image of the front, and a figure slightly tinted to show the lines of the future work. Scenography (perspective) also is the shading of the front and the retreating sides, and the correspondence of all lines to the vanishing point, which is the centre of a circle. Ibid., I. ii., pp. 24-27.

⁸⁴ Ibid., p. 319.

⁸⁵ It is described as when 'a horizontal plane cuts through the building so as to remove that part of the building above the cutting plane.' Rendow Yee, *Architectural Drawing: a Visual Compendium of Types and Methods* (New York, 1997), p. 44.

antiquity, although some have become subsequently associated with the text.⁸⁶ Of the few extant architectural drawings from antiquity the plan format is by far the most popular, a fact reflected in later medieval examples. One monumental example reflects Vitruvius' description of the format. The *Forma Urbis Romae* (fig. 6), was originally a large plan of Rome (18 x 13 m) mounted on a wall in the interior of the *Templum Pacis*. It now survives in 1,186 pieces.⁸⁷ The plan is cut into the stone, with single lines representing the boundaries of structures or important areas. One of the most complete samples is of the theatre, marked *Theatrum* on the plan (fig. 7). This shows a hemisphere containing two sets of large and smaller oblong rectangles following the curve of the semi-circle. The striking clarity and legibility of the plan is emphasised by the simple lines; and to the north small circles, representing columns, offer a simple scale to gauge the relative size of the structures. Wall widths are not consistently shown, possibly due to the incised nature of the relief.⁸⁸ Vitruvius describes the ground-plan in terms of how it was constructed (with compasses and rule) and the actual appearance which shows the outline of the buildings. It would seem from this that Vitruvius would have understood the Roman plan as corresponding to his definition of *ichnographia*. The entirety of the quoted passage implies a functional aspect to the drawing as aiding the arrangement and positioning of the different architectural elements.

The structure of Vitruvius' description of *orthographia* is quite different from that of *ichnographia*. Instead of emphasizing the manner of creating the drawing, he focuses on its appearance. *Orthographia* shows the front of a building, but it must also be in proportion. In this passage Granger has translated the term *rationibus* as 'in proportion,' a term and

⁸⁶ Barbara Obrist, 'Wind Diagrams and Medieval Cosmology', *Speculum*, 72 (1997), pp. 33-84.

⁸⁷ There is a digital project underway to reconstruct this plan from the remaining fragments can be found at <http://formaurbis.stanford.edu/> [accessed: 21/02/2015]

⁸⁸ Including the wall widths would have doubled the amount of work, without offering substantially more information.

translation which may be interrogated further. Proportion in the context of architectural drawings means a consistent measurement was used to scale the drawing from its life-size measurements to a reasonably accurate depiction on a two-dimensional surface. Proportional drawings are not a feature of architectural drawings in the early medieval period, and do not appear until later in the Middle Ages.⁸⁹ Granger's translation may not be entirely reflective of Vitruvius' meaning, and would imply that the technique of applying a consistent proportion to architectural drawings was a feature of architectural drawings from antiquity but which fell out of use. *Orthographia* is a cognate to the modern architectural use of orthographic drawings, where no perspective is used, leaving clear understandable lines to describe any side of a building.⁹⁰ While Vitruvius' description does not explicitly state that perspective is removed from *orthographia*, it would seem that the insistence on it being present in the next category *scaenographia*, discussed below, would imply that none should be used for the elevations – or at least that it is not important for *orthographia*, in the same way. A large number of the drawings discussed in this thesis are represented orthographically.

Drawings which depict only the front of a building without the presence of perspective are rare in the medieval period. Frequently, antique and medieval artists conflated plans and elevations, especially when there was enough space to do so. For example, the *forma urbis Romae*, in certain places, shows the aqueducts with arches underneath, representing their elevated form. This practice continues well into the thirteenth century and beyond; there will be several examples in the following discussion of early medieval architectural representations. Recognising this conflation of plan and elevation views is an important step to understanding

⁸⁹ Arnold Pacey, *Medieval Architectural Drawing: English Craftsmen's Methods and their Later Persistence (1200-1700)* (Stroud, 2007), p. 161.

⁹⁰ Orthographic drawings are those which are presented or projected at ninety degrees: Yee, *Architectural Drawing*, p. 41.

medieval representations of architecture. The fronts of buildings are used to depict certain sacred buildings in a number of different contexts. Conflation is discussed in more detail below; however, for now it is enough to note that the Vitruvian division between architectural drawing formats is not strictly adhered to in the medieval period. This is most obvious when looking at *scaenographia*.

Scaenographia architectural drawings are those drawn in perspective, unlike plan and elevation drawings. Vitruvius' insistence on the presence of perspective for *scaenographia* is a problem when examining medieval architectural drawings. While it seems that the mathematical laws of perspective may have been known in antiquity this knowledge was lost until the fifteenth century, when Brunelleschi essentially rediscovered the technique.⁹¹ Therefore, it would be unreasonable to expect a complete medieval example of Vitruvius' *scaenographia*.⁹² The purpose of this category is to show at least two sides of the building in space, making it possible to visualise it on and in a specific site. Lampl's typology of early medieval architectural representations, discussed above, demonstrates that some types of drawings were created to illustrate at least two sides of a structure, thus fitting loosely with Vitruvius' definition.⁹³ One example is what Lampl terms a 'split edifice.'⁹⁴ It follows the scheme side-front-side, where the representation is split down the middle and folded outwards so the viewer can see three sides simultaneously. It is clear from this that Vitruvius' definitions are not strictly followed in the medieval period; however it should also be clear that

⁹¹ Edgerton, *Linear Perspective*, p. xvii; see also, John White, *The Birth and Rebirth of Pictorial Space*, 2nd ed (London, 1967), p. 113.

⁹² One author was not sure of *scaenographia*'s meaning, Davis-Weyer, *Early Medieval Art*, pp. 107-108.

⁹³ Lampl, 'Schemes', pp. 6-12.

⁹⁴ *Ibid.*, p. 9.

architectural drawings are complicated hybrids in which parts must be disassembled in order to understand what the artist is attempting to represent.

Adomnan's De Locis Sanctis

Early in the Christian period it would seem that Vitruvius' definitions for three distinct types of drawings had begun to break down. The ground plan became especially important for the depiction of the Holy Sites at Jerusalem in particular, and the Holy Land in general. One of the earliest accounts stems from an anonymous traveller from Bordeaux, who describes the various sites: the nun, and Holy Land pilgrim, Egeria.⁹⁵ Her account comprises some of the only verifiable information regarding the appearance of Jerusalem in the fourth century.⁹⁶ The earliest known representation of the Church of the Holy Sepulchre in Jerusalem is a mosaic discovered in 1971 at Tourny.⁹⁷ The mosaic appears as three concentric circles – representing the rotunda of the sepulchre – above there are two pediments superimposed on each other with a cross placed at the top of the larger one. It is constructed using black and white mosaic tiles, thus making the plan highly legible.⁹⁸ The Sepulchre itself was built on the reported site of Christ's burial and subsequent resurrection. The importance of the site was reflected in the Emperor Constantine's (d. 337) insistence that a basilica should be constructed on the site.⁹⁹ This was built by the middle of the fourth century. Concurrently to this basilica, a rotunda was

⁹⁵ Latin edition of Egeria's account can be found in *Itineraria et alia Geographica*, edited by AET. Franceschini and R. Weber, CCL 175 (2 vols., Turnhout, 1965), I., pp. 37-103

⁹⁶ Egeria, *Egeria's Travels*, trans. John Wilkinson (Warminster, 1999). There are no reproductions of the mosaic and photography is not permitted in the gallery, making it difficult to obtain an image to include alongside this discussion.

⁹⁷ The Holy Sepulchre is the church which stands in the place of Christ's tomb. Colin Morris, *The Sepulchre of Christ and the Medieval West: From the Beginning to 1600* (Oxford, 2005).

⁹⁸ The mosaic has been removed from the ground and now sits upright behind a glass case.

⁹⁹ Eusebius of Caesarea, *Life of Constantine*, trans. Averil Cameron, George Stuart Hall (Oxford, 1999), pp. 132-133.

built around a shrine. The mosaic would seem to depict this rotunda, as well as its entrance.¹⁰⁰ The right side of the mosaic (as it stands today) is depicted with three concentric circles. Jutting out of the left side of the outermost circle is a tower-like construction, surmounted by a gable end and a cross at the very top. It would seem clear that this representation conflates the plan (in the form of the concentric circles), and the elevation (in the form of the gable). This fourth-century plan is one of the earliest known in the Middle Ages, but has received no attention from scholars. Its appearance is very similar to Adomnan's plans of the Holy Sepulchre which are slightly later in date.

Adomnan (d. 704) was abbot of Iona abbey off the west coast of Scotland. He acted as ambassador from the Irish to Northumbria to release prisoners, and spent some time with the abbot Ceolfrith at Bede's monastery of Wearmouth and Jarrow.¹⁰¹ Adomnan's description of the Holy Land in his *De locis sanctis* provides four church plans to clarify the appearance of buildings including the Holy Sepulchre.¹⁰² In *De locis sanctis* Adomnan writes a description of the Holy Land which he claims was given to him by Arculf, a cleric shipwrecked on Iona. Thomas O'Loughlin, however, argues that Arculf is Adomnan's creation, a foil for his description, who offers a convenient device in writing the text, and in the process granting the authenticity of experience.¹⁰³ *De locis sanctis* is divided into three books, with the first focusing on the sites and buildings of Jerusalem.¹⁰⁴ Adomnan also refers to drawings in the text, including them to make the textual descriptions clearer. Not all manuscripts containing *De*

¹⁰⁰ Kenneth John Conant, 'The Original Buildings at the Holy Sepulchre in Jerusalem', *Speculum*, 31 (1956), pp. 1-48.

¹⁰¹ Adomnan, *Adomnán's Life of Columba*, trans. Alan Orr Anderson and Marjorie Ogilvie Anderson (Oxford, 1991), p. xl.

¹⁰² Adomnan, *Adomnan's De locis sanctis*, trans. Denis Meehan (Dublin, 1958). Spelling of Adomnan's name is inconsistent. For the body of the thesis I have followed Thomas O'Loughlin's practice as the most current.

¹⁰³ Thomas O'Loughlin, *Adomnán and the Holy Places: the Perceptions of an Insular Monk on the Locations of the Biblical Drama* (London; New York, 2007), pp. 62-63; also, Thomas O'Loughlin, 'Adomnán and Arculf: The Case of the Expert Witness', *Journal of Medieval Latin*, 7 (1997), pp. 127-146.

¹⁰⁴ The second book considers the area around Jerusalem, and the third book describes Constantinople.

locis sanctis contain the plans, and the earliest that do stem from the ninth century. Adomnan's references to the drawings, and description of Arculf drawing the plans on a wax tablet, indicates that the plans were originally part of the text.¹⁰⁵

Adomnan provides a plan for the church located at the site of Jacob's Well, constructed outside the walls of Jerusalem (fig. 8).¹⁰⁶ It is described as having four arms in the shape of a cross with the well located in the centre. There are three extant manuscripts which include plans of the Jacob's Well church, and each show a similar structure. Each has an opening on the end of the four arms, even though these openings are not mentioned in the text.¹⁰⁷ The circular well at the centre is placed within a square in each of the three extant versions. The majority of the architectural elements are roughly the same, the overall shape changes little between each of the three extant versions. Wilkinson believes the ninth-century manuscript Vienna, Österreichische Nationalbibliothek, Cod. Vindobonensis 458 is the most reliable version of Adomnan's original drawing.¹⁰⁸ This manuscript shows the west and east arms of the church extending longer than those pointing north and south, making it unusual for a cross shape.¹⁰⁹ However, the Paris manuscript of the text (Paris, BnF, MS lat. 13048) is ostensibly based on the Latin cross because the south arm is longer than the others, while a

¹⁰⁵ 'We questioned the Holy Arculf carefully concerning these, especially concerning the sepulchre of the Lord and the church built over it, the shape of which Arculf himself depicted for me on a waxed tablet', Adomnan, *De locis sanctis*, p. 43.

¹⁰⁶ The Gospel of John states that Jesus rested on the well while passing through Samaria, John 4.5-6.

¹⁰⁷ *Itaque prope hanc eandem civitatem quandam cardines formata extenditur quasi in similitudinem crucis; cuius figura inferius describitur. In cuius medietate fons Jacob, qui et puteus dici solet, ad eius .iiii. respiciens partes intrinsecus medius habetur [...].* 'Close to this city he saw a church built outside the wall, which is so shaped as to branch into four parts extending towards the 4 cardinal points of the world, in the likeness of a cross as it were. A plan of it is given below. In the interior, as its centre, facing all of the 4 wings, is the fount of Jacob, which is wont to be called a well too.' Adomnan, *De locis sanctis*, pp. 90-91.

¹⁰⁸ J. Wilkinson, *Jerusalem Pilgrims before the Crusades* (Warminster, 1977), p. 193.

¹⁰⁹ Wilkinson believes that each of the plans are pointed north, like today's maps. O'Loughlin supports this claim by demonstrating that at least two of the other plans, those for the Holy Sepulchre and the Basilica on Mount Sion, are orientated northwards, Thomas O'Loughlin, 'Adomnan's Plans in the Context of his Imagining "the Most Famous City"', in Lucy Donkin, Hanna Vorholt (eds.), *Imagining Jerusalem in the Medieval West* (Oxford, 2012), pp. 15-40.

copy in the Zurich manuscript is similar to a Greek cross because the arms seem to be of equal length. The different types of crosses in the manuscripts may indicate that the textual description as *in similitudinem crucis* was taken to mean different shapes by different copyists.

The next plan shows Adomnan's drawing for the Chapel of the Ascension, situated on the Mount of Olives towards the east of Jerusalem (fig. 9). Traditionally this is the spot where Christ ascended into heaven, as described at the beginning of the Book of Acts (Acts 1.9). A church was built over the footprints said to belong to Christ, which Adomnan describes in some detail.¹¹⁰ Wilkinson never explains the appearance of the building, only giving the impression that it is a series of three concentric circular vaulted paths with a large bronze structure in the centre. This is understandable considering the language used by Adomnan, *ubi grandis ecclesia stat rotunda, terras per circuitam cameratus habens porticos desuper textas*.¹¹¹ Indeed, despite a number of works on Adomnan's *De locis sanctis*, there are few which seek to explain the drawings in terms of the architecture they supposedly represent.¹¹² The key term Meehan (and it seems Wilkinson) have difficulty with is *porticus*. Meehan translates this as 'portico,' but its modern meaning is deceptive and seems to have changed at various times from antiquity to the modern period; as a result it is quite ambiguous.¹¹³ The term may also be translated as 'gallery'.¹¹⁴ Is Adomnan implying the church has three galleries, meaning there are three storeys in total (as one gallery cannot be on the same level as another

¹¹⁰ Adamnan, *De locis sanctis*, pp. 65-69. In the fourth century the pilgrim Egeria describes a rotunda on the site of the Ascension, but it is most probably not a church at this stage: Egeria, *Egeria's Travels*, trans. John Wilkinson (Warminster, 1999), pp. 14-15.

¹¹¹ Adamnan, *De locis sanctis*, p. 65. 'A great round church stands there, which has within its circuit three arched porticoes roofed in over.'

¹¹² The exception is Thomas O'Loughlin, 'Adomnan's Plans', pp. 15-40. Here O'Loughlin points out that much of the literature has accepted Adomnan's explanations at face value, for example, Delano-Smith, Kain, *English Maps: A History* (London, 1999), p. 10.

¹¹³ Seán Connolly discusses the ambiguity of the term *porticus* in particular: Bede, *Bede: On the Temple*, trans. Seán Connolly (Liverpool, 1995), pp. xiv-xv.

¹¹⁴ Ibid.

in the same part of a building)? If so, this drastically affects how one should read the plan. The chapel of the Ascension is not three circular concentric loggias placed around a bronze structure; it is envisioned as simple three-storey rotunda which tapers as it rises towards the dome. This is a much more regular arrangement for a classically inspired piece of religious architecture, and echoes the better known plan of the Holy Sepulchre which is discussed below.¹¹⁵ This recreation is conjectural and simply highlights the problems of reading architectural plans from the period.

The next building for which Adomnan provides a drawing is the 'Great Basilica built on Mount Sion' (fig. 10).¹¹⁶ Adomnan's actual description is very brief compared to other descriptions for which plans are provided. Each drawing shows the building as roughly rectangular.¹¹⁷ The walls are filled in with colour in two versions, while the other is left blank, perhaps unfinished. A conflation of plan and elevation is implied in the Vienna manuscript, with the inclusion of the column where Christ was bound and whipped.¹¹⁸ Wilkinson points out the presence of textual indications included in the plan, the text of which does not stem from *De locis sanctis* itself.¹¹⁹ *Tituli* do not appear each of Adomnan's plan, only in this drawings for the basilica and the Holy Sepulchre, which is discussed below. Wilkinson speculates that the textual notes may have stemmed from another source. The notes are not mere titles of the buildings, like the *Theatrum* on the *Forma*, but a concerted attempt to

¹¹⁵ For comparisons between early Christian *mausolea* and the Holy Sepulchre see, Roger Stalley, *Early Medieval Architecture* (Oxford, 1999), pp. 63-78. in chapter 2 we will discuss the problems Richard of Saint Victor recognised plans have when attempting to provide information about several floors.

¹¹⁶ Adomnan, *De locis sanctis*, pp. 62-63.

¹¹⁷ Adomnan describes it only as a 'huge basilica' (*pergrandi basilica*). Adomnan, *De locis sanctis*, pp. 62-63.

¹¹⁸ O'Loughlin suggests these may serve to represent the imprints left by Christ when flagellated, although in the Vienna manuscript there are twelve marks, making this meaning unlikely, O'Loughlin, 'Adomnan's Plans', p. 34.

¹¹⁹ Wilkinson, *Pilgrimage*, p. 378.; discussed further in Thomas O'Loughlin, 'Adomnan's Plans', p. 36.

describe individual parts of a building.¹²⁰ None of these parts are discussed in Adomnan's text. O'Loughlin persuasively argues that they are drawn from the sources Adomnan used for the *De locis sanctis*, Eucherius' *De situ Hierusolimae* and the anonymous *Breviarius de Hierosolyma*.¹²¹ The drawing is Adomnan's attempt to clarify contradictions regarding the site of the church, and whether it was located inside or outside the city.

The final, and most complicated, plan Adomnan offers is for the Holy Sepulchre itself.¹²² It combines the extensive use of textual additions and the hybrid type plan/elevation to depict the rotunda. The Vienna manuscript shows a round structure (fig. 11), except that there are two openings to the right side, one to the outside, and the other enters into the circular space around the rotunda.¹²³ Different chapels and important sites are indicated using *tituli*, such as Golgotha, and the place where the crosses of Christ and the two thieves were found. The plan places the actual sepulchre near the centre of the rotunda, with the Vienna manuscript including twelve lamps within the sepulchre itself. Morris' extended study of the Sepulchre includes a comparison with Adomnan's plan, but Morris never describes the appearance of the building and its relation to the drawing.¹²⁴ However, if we interpret the concentric circles in the same way as for the chapel of the Ascension, then Adomnan is again illustrating a three-storey tower, a form which corresponds with recreations of the fourth-century structures.¹²⁵ The presence of a column presented in elevation in the plan for the basilica may allow us to understand the entrance to the rotunda. The bases of at least four of the vertical lines of the

¹²⁰ Working left to right in a clockwise direction these *tituli* are: *Lapis super quem dominus flagellatus est; locus cenae domini; Hic spiritus sanctus super apostolos descendit; Hic sancta Maria obit; Porta; Hic columna marmorea stat, cui dominus adherens flagellatus est.*

¹²¹ O'Loughlin, 'Adomnan's Plans', p. 30.

¹²² Adomnan, *De locis sanctis*, pp. 43-59. The description takes place over several chapters, and includes sections concerned with the individual chapels within the Sepulchre.

¹²³ Described in relation to the direction of the winds. O'Loughlin uses this to show that the drawing is orientated northwards, Thomas O'Loughlin, 'Adomnan's Plans', pp. 15-40

¹²⁴ Morris, *Sepulchre*, p. 102.

¹²⁵ Conant, 'The Original', plate V.

north entrance flair outward, similar to that of a column. What may be being represented is a series of columns, thus illustrating the appearance of these entrances. Here, the interior of the rotunda is already quite crowded with different elements, and in this context arcs are used to signify the three aedicules for altars.

Having described Adomnan's drawings and the problems associated with their interpretation it is possible to turn to why he includes the drawings in the first place, thus casting light on the purpose of the architectural representations. Vitruvius' assumption that architectural drawings would be used to establish the proportions and overall appearance of a building before its construction is not Adomnan's objective. O'Loughlin states, 'Isidore's [of Seville] 'maps' are essentially illustrations to clarify verbal text and they have no independent claim to describe reality other than what the text says. Adomnan also uses illustrations in this way: the plans/drawings are to make clear what is obscure in his writing.'¹²⁶ Here O'Loughlin is specifically referring to Isidore's *De natura rerum*, linking both authors' use of a pair of compasses (*rota*) and straight-edge to draw the diagrams.¹²⁷ 'All Isidore's drawings were made with a compass and a straight-edge; Adomnan's are made in exactly the same way, while the earliest use of *rota* (compass) in the sense of an illustration (apart from being used in the *incipit* and *explicit* of texts in Isidorian MSS) is in the *De locis sanctis*.¹²⁸ It is interesting to note that O'Loughlin's link with Isidore's diagrams reflects a tendency for the independent transmission of the diagrams associated with both works. Adomnan's diagrams become a part of Bede's (d. 735) work *De locis sanctis*, possibly added to clarify some aspects of Bede's writings. Isidore's diagrams display this same tendency to become separated from their original context

¹²⁶ T. O'Loughlin, *Adomnan and the Holy Places*, p. 154.

¹²⁷ Isidore's work will be discussed in more detail below.

¹²⁸ O'Loughlin, *Adomnan and the Holy Places*, p. 154.

and become attached to other works or be transmitted independent of their texts.¹²⁹ For example, Adomnan's drawing for the Holy Sepulchre appears in Oxford, Bodleian Library, MS Laud Misc. 241, f. 85r, accompanied by the works of Saint Gregory the Great (fig. 12), although it is not clear why the image is included in this case. Despite the ambiguity surrounding Adomnan's architectural forms, his use of figures to clarify problematic elements is a function of the twelfth-century diagrams examined in this thesis.

The Codex Amiatinus

Mention of Bede takes us to the next example of architectural representation before the twelfth century. The Codex Amiatinus is a pandect created in Bede's Northumbrian monastery of Wearmouth-Jarrow in the early eighth century.¹³⁰ It is one of three pandects created at this time in the monastery, and certainly the largest of them.¹³¹ The codex contains several images and diagrams at the beginning of the manuscript, one of which is an architectural drawing of the Tabernacle described in Exodus (fig. 13). The source text for the Codex Amiatinus is thought to be Cassiodorus' (c. 485 – c. 585) commissioned pandect, the Codex Grandior. The Codex Grandior was brought back from Rome by Ceolfrith when he travelled there with Benedict Biscop.¹³² While in Northumbria, Cassiodorus' description of the pandect he had 'caused to be made,' was connected with the book Ceolfrith had brought back from Rome.¹³³ Hence, Bede makes direct statements regarding Cassiodorus' pictures of the Temple.¹³⁴

¹²⁹ Harry Bober, 'An Illustrated Medieval School-Book of Bede's 'De Natura Rerum', *The Journal of the Walters Art Gallery*, 19 (1956-1957), pp. 64-97, p. 74.

¹³⁰ A pandect in this case is a complete copy of all the books of the bible, both Old and New Testaments.

¹³¹ Paul Meyvaert, 'Bede, Cassiodorus, and the Codex Amiatinus', *Speculum*, 71 (1996), pp. 827-883, here p. 838

¹³² Anon, *The Life of Ceolfrid*, edited by Douglas Samuel Boutflower (Sunderland, 1991), p. 69. See also, Francis Wormald, 'Bible Illustration in Medieval Manuscripts', G.W.H. Lampe (ed.), *The Cambridge History of the Bible*, (3 vols., Cambridge, 1969), II, pp. 309-337, here p. 310.

¹³³ Meyvaert provides a discussion on the chronology of Bede's realisation that the Codex Grandior was in fact one and the same as the that mentioned in Cassiodorus' writings.

¹³⁴ Bede, *Tabernacle*, II. 12, p. 92; Bede, *Temple*, II. 17, p. 66.

Cassiodorus, however, describes another image, one of the Temple which is not and never has been included in Codex Amiatinus.¹³⁵ Here, I discuss the image of the Tabernacle and review previous studies of the lost image of the Temple.

Bede offers a detailed exegesis of the Tabernacle in his work *De tabernaculo*, in which he has explicitly made use of the Cassiodorus' *picturae*. The image of the Tabernacle in Codex Amiatinus derives from the description of the structure in Exodus 25-31. God orders Moses to make a sanctuary in which the divine presence may dwell while the Israelites are in the wilderness. A long description of the building and the vessels is given; the craftsmen Beseleel and Ooliab are introduced, and are tasked with creating the Tabernacle. The materials used to construct the Tabernacle and the vessels receive strong emphasis, but the actual appearance of the tent is somewhat unclear. Inside the Tabernacle, behind a purple veil, stood the Ark of the Covenant holding the tablets of the commandments given to Moses by God. Around this tent, on all sides, various liturgical vessels were placed: there is 'an incense altar, a table, a seven-light candelabrum, an eternal light, Aaron's staff that miraculously blossomed, the vessels that are used by the priests, possibly a container of manna, and a scroll written by Moses.'¹³⁶ For Bede at least, the extended description given to the Tabernacle meant it was a worthy object of exegesis, and hence is the object of study in his *De tabernaculo*.¹³⁷ As Cross points out, 'more verses of the Pentateuch are devoted to it [the Tabernacle] than to any other object.'¹³⁸ Bede's treatment of the Tabernacle, and especially its spiritual significance, 'shows Bede as a creative and original exegete working with the benefit of extensive patristic models

¹³⁵ There is however a debate if there were two pictures originally, or if only the Tabernacle was mentioned. E.g., Meyvaert, *Bede*, p. 845. It does seem odd that both Cassiodorus and Bede would conflate two different structures, especially when the latter wrote a separate treatise on each one.

¹³⁶ Renate Rosenthal-Heginbottom, 'Tabernacle', in David Noel Freedman (ed.), *Anchor Bible Dictionary* (6 vols., London, 1992), VI, pp. 292-300, here p. 292.

¹³⁷ Meyvaert uses the same argument to argue to determine why the image of the Temple was excluded from Codex Amiatinus.

¹³⁸ Rosenthal-Heginbottom, 'Tabernacle', p. 293.

to follow.¹³⁹ *De tabernaculo*, then, comprises a largely original attempt by a medieval author to recover the appearance of the Tabernacle, and later the Temple.¹⁴⁰ Bede prioritised the spiritual significance of the Tabernacle and not its historical appearance. The driving force behind this decision is taken from St. Paul, who writes on the Book of Exodus, 'All these things were done as an example for us and were written down for us, and so we must scrutinise them carefully for their spiritual meaning.'¹⁴¹ However, when Bede does discuss the appearance of the Tabernacle it becomes clear that he has a very fixed and lucid idea of its appearance, an image which he takes directly from Cassiodorus' Codex Grandior. Bede writes, '*vidimus in qua [pictura] etiam utrique altari et holocausti videlicet et incensi pedes quattuor fecit quod utrumque eum sicut et tabernaculi et templi positionem a doctoribus iudaeorum didicisse putamus.*'¹⁴² The image he refers to here must be that from the Codex Grandior, and then copied into the Codex Amiatinus.

The Tabernacle image in Codex Amiatinus shows the majority of the structure from above.¹⁴³ It presents a large rectangular enclosure framing the courtyard. Another rectangular structure shows the Tabernacle proper, comprising two spaces – the smaller space at the top identified as the Holy of Holies (*Sanctum Sanctorum*). As an architectural drawing its format may be described as another plan/elevation conflation, similar to the plans in Adomnan's *De locis sanctis*. The enclosure which frames the entire Tabernacle shows columns in elevation, forsaking the restrictive plan style of simple circles used to represent columns in the *Forma Urbis Romae*. The liturgical vessels are exclusively shown in a *scaenographic* format, although

¹³⁹ Bede, *Bede: On the Tabernacle*, trans. Arthur G. Holder (Liverpool, 1994), p. xvii.

¹⁴⁰ *De Templo* was certainly written after *De tabernaculo*, Bede, *Temple*, p. xviii.

¹⁴¹ 1 Cor 10:11.

¹⁴² 'In this picture he also portrays four feet on each of the altars, that is, on both the altar of the holocaust and the altar of incense. We suppose that he learned both of these things from teachers among the Jews, in the same way that he learned about the layout of the Tabernacle and the Temple.' Bede, *Tabernacle*, p. 92.

¹⁴³ Catherine Delano-Smith states that the image represents the Temple, 'within which is set the Tabernacle,' but it is unclear how or why she identifies it in this manner, Delano-Smith, Kain, *English Maps*, p. 9.

their form may result from an iconographic tradition.¹⁴⁴ While the impression of the entire layout is given, the artist has gone to great lengths to give as much information about the Tabernacle as possible. For example, the interior and exterior of both the outer set of columns and the Tabernacle itself are shown. The columns to the top and right are clearly seen with the curtains passing on the outside of them, and must illustrate the interior side of the Tabernacle's boundary.¹⁴⁵ The left and bottom sides however, only show the capitals and bases of the columns, with the curtain passing in front of them, as a result this must illustrate the exterior. Exactly the same method is used for the Tabernacle itself. The top and right sides show the interior, while the left and bottom side show the exterior. The consistency with which the artist uses the above system indicates a considered approach to the depiction of architecture, and especially the problem of how one shows the interior of a structure, while indicating the difference of view to the reader, without the need for *tituli*.

When it comes to discussing the general appearance of the Tabernacle in the Codex Amiatinus, Meyvaert links it with much later images in Byzantine Octateuchs and those found in Cosmas Indicopleustes' *Christian Topography*.¹⁴⁶ Cosmas' possible influence on later medieval descriptions of the universe will be discussed in the third chapter. Cosmas' work offers a literal and spiritual description of his travels around the Middle East and Africa, as well as possibly India. Implicit within the descriptions is a clear cosmology in which all these lands are placed; 'the author imagined the cosmos as a vaulted building, based on a flat, rectangular earth and divided by the firmament into two superimposed spaces.'¹⁴⁷ According to Cosmas

¹⁴⁴ Bianca Kühnel, 'Jewish Symbolism of the Temple and the Tabernacle and Christian Symbolism of the Holy Sepulchre and the Heavenly Jerusalem: A Study of Their Relationship in Late Antique and Early Medieval Art and Thought', Aliza Cohen-Mushlin (ed.), *Jewish Art* (Jerusalem, 1987), pp. 147-168, here p. 151.

¹⁴⁵ The curtain is described as passing on the outside of the columns. Kühnel, 'Jewish Symbolism', p. 166.

¹⁴⁶ Meyvaert, 'Bede', p. 846.

¹⁴⁷ Maja Kominko, 'The World of Cosmas : The Universe Described and Depicted in Byzantine Manuscripts of the Christian Topography', (Unpublished DPhil thesis, University of Oxford, 2006), p. 1.

the Tabernacle's two spaces act as a microcosm, and illustrate his particular cosmology. There are two spaces, the smaller one, which corresponds to the sky is considered holier than the larger space below it. To illustrate this, several miniatures are included in all three extant versions of Cosmas' work (e. g. fig. 14). Kominko draws comparison between Cosmas' miniatures and the Tabernacle in Codex Amiatinus.¹⁴⁸ While the subjects are clearly discernable from the image, the format of each drawing is quite different. Whereas the Codex Amiatinus uses the hybrid type discussed above, all of Cosmas' miniatures use a *scaenographia* format. The long side of each is shown with receding lines which imply a three-dimensional structure. The top of the Tabernacle has been removed, which allows one to see inside the tent, where several of the liturgical vessels are placed. Despite these overall differences in format, Kominko suggests a common example for both images of the Tabernacle. The earliest image would most likely be Jewish in origin, although this has been lost and is difficult to recreate. However, from late antiquity at least there would seem to be a strong tradition of schematically representing architecture.

The Saint Gall Plan

Schematic representations of architectural plans are a rarity, but the following plan is both highly similar to modern plans and very legible. The Saint Gall plan is one of the most well-known and often studied architectural plans from the Middle Ages. It was completed at the beginning of the ninth century, having been sent from an anonymous source to the bishop, Gozbertus, in Saint Gall, Switzerland.¹⁴⁹ The ninth-century plan illustrates a monastery complex

¹⁴⁸ Ibid., p. 186.

¹⁴⁹ The recipient is known by a transmittal note which appears in the upper margin of the plan. It states, *Haec tibi dulcissime fili cozb[er]te de posicione officinarum paucis exemplata direxi. quibus sollertiam exerceas tua[m]. meamq[ue]. devotione[m] utcumq[ue]. cognoscas. qua tuae bonae voluntati satisfacere me segnem non inveniri confido. Ne suspiceris autem me haec ideo elaborasse. quod vos putemus n[ost]ris indigere magisteriis. sed potius ob amore[m] dei tibi soli p[er]scrutinanda pinxisse amicabili fr[ater]natatis intuitu crede. Vale in xpo semp[er] memor n[ost]ri am[en].* 'For thee, my sweetest son Gozbertus, have I drawn this briefly annotated copy of the

with a large abbey church and cloister; there are also plans for ancillary buildings such as those needed for farming and the housing of guests (fig. 15).¹⁵⁰ It is drawn on three membranes which are sewn together, which unfold to reveal the plan.¹⁵¹ On the reverse side there is a life of St. Martin, although this text was written after the plan was completed.

Scholarship is divided over the purpose of the plan. For example, Walter Horn and Ernest Born's three-volume work on the plan highlights its formal characteristics in great detail. Its purpose, they argue, is that it reflects and is a result of Carolingian monastic reforms in 816 and 817.¹⁵² The authors write, 'the arrangement of the buildings shown on the Plan of St. Gall aimed [for] the establishment of guiding rules that could be followed in the physical layout of a monastic settlement.'¹⁵³ Similar to this, the plan has been described as an 'exhaustively detailed and comprehensive plan for a monastic building complex,' one which responds to the contemporary requirements of Carolingian monasticism, having been 'designed by learned Carolingian scholars.'¹⁵⁴ Horn and Born's claim that the reforms centred at Aachen in 816 and 817 gave rise to the Saint Gall plan was rejected by later scholars, because there is no evidence that a plan or stringent measurements for Benedictine foundations were laid down during these reforms.¹⁵⁵ Eugene Kleinbauer is slightly more circumspect in regard to how useful the

layout of the monastic buildings, with which you may exercise your ingenuity and recognise my devotion, whereby I trust you do not find me slow to satisfy your wishes. Do not imagine that I have undertaken this task supposing you to stand in need of our instruction, but rather believe that out of love of God and in the friendly zeal of brotherhood I have depicted this for you alone to scrutinize. Farewell in Christ, always mindful of us, Amen.' Translation found in Walter Horn and Ernest Born, *The Plan of St. Gall* (3 vols., Berkeley, 1979), I, p. 9.

¹⁵⁰ Date discussed in *Ibid.*, p. 25.

¹⁵¹ *Ibid.*

¹⁵² *Ibid.*, p. 52.

¹⁵³ *Ibid.*, p. 24.

¹⁵⁴ Lawrence Nees, 'The Colophon Drawing in the Book of Mulling: A Supposed Irish Monastery Plan and the Tradition of Terminal Illustration in Early Medieval Manuscripts', *Cambridge Medieval Celtic Studies*, 5 (1983), pp. 67-91, here p. 68. In this work Nees likens the St. Gall plan to a roughly contemporary, but badly faded drawing on the flyleaf of the Book of Mulling, although it is not clear if the drawing does represent architecture.

¹⁵⁵ Lawrence Nees, 'The Plan of St. Gall and the Theory of the Program of Carolingian Art', *Gesta*, 25 (1986), pp. 1-8, here p. 5.

plan would have been as an 'exemplar for future use.'¹⁵⁶ He points out that in effect all drawings in this manner could carry out the function of a template, but that does not mean the drawings were conceived along such lines.¹⁵⁷

Wolfgang Braunfels rejects these historical and architecturally rooted arguments, and focuses on the immediate intellectual context of the plan, calling it the 'most astonishing document of early medieval Benedictine monastic architecture.'¹⁵⁸ Braunfels identifies the plan as a manifestation of the attempt to achieve perfection (*perfectio*), one which is related to contemporary attitudes to 'Carolingian spirituality and piety.'¹⁵⁹ Mary Carruthers moves the plan further from medieval architectural matters into the exclusive realm of Carolingian monastic praxis; she writes, 'The Plan of St. Gall is the earliest surviving instance of [...] a device of memory work found commonly, often in very elaborate fashion, in the literature of the later Middle Ages.'¹⁶⁰ Carruthers continues, 'The 'Plan of St. Gall' is basically a meditation machine,' one in which 'certain features seem modelled on details of the visionary Temple of Ezekiel.'¹⁶¹ For Carruthers, the plan represents a 'wholly fictional building,' which is exemplary for the purposes of monastic meditation.¹⁶² Stanford Anderson attempts to redress the balance away from a specifically mnemonic rendering of the plan, by simply referring to it as a 'type,' one that follows concepts of medieval architectural iconography, where the imitation of a

¹⁵⁶ W. Eugene Kleinbauer, 'Pre-Carolingian Concepts of Architectural Planning', in Marilyn J. Chiat and Kathryn L. Reyerson (eds.), *The Medieval Mediterranean: Cross-Cultural Contacts*, (St. Cloud, Minn., 1988), pp. 67-79, here p. 67.

¹⁵⁷ Kleinbauer also highlights the combination of 'vertical line projection and outline elevation', in the plan, which I have termed above as a the conflation of plan and elevation.

¹⁵⁸ W. Braunfels, *Monasteries of Western Europe: The Architecture of the Order* (London, 1993), p. 37.

¹⁵⁹ *Ibid.*, p. 44.

¹⁶⁰ Mary Carruthers, *The Craft of Thought: Meditation, Rhetoric, and the Making of Images, 400-1200* (Cambridge, 2008), pp. 229-230. Here I will only describe Carruthers' work on the Saint Gall plan; in chapter two I will consider her theories of architectural imagery in detail.

¹⁶¹ *Ibid.*

¹⁶² *Ibid.*, p. 238. Paul Crossley reiterates the argument that there is no evidence that the plan was ever brought to construction: Paul Crossley, 'Ductus and Memoria: Chartres cathedral and the workings of rhetoric', in Mary Carruthers (ed.), *Rhetoric Beyond Words: Delight and Persuasion in the Arts of the Middle Ages* (Cambridge, 2013), pp. 214-249, here p. 233.

prototype of reality was considered unnecessary by the artist, and only a 'memento of a venerated site' was required.¹⁶³

The purpose of the plan is unclear, and scholarly discussions of it reflect divisions in the disciplines of architectural and intellectual history. The Saint Gall plan represents a building, but certainly one that was never constructed. This lack of material existence has led scholars such as Carruthers to conclude that the purpose underlining the plan is intellectual in origin. This thesis will not make a conclusion regarding the status of the Saint Gall plan, but it will demonstrate that the intellectual and didactic culture which surrounded monastic architectural representations supports both sides of the argument. Architectural representations were rooted in material culture, because they present or imply a structure, and indeed exist within the confines of the codex. However, underlining this material presence is an acknowledgment that, by rooting abstract concepts in material culture, information could be communicated in an efficient manner to students. One way to demonstrate this is in relation to the quadrivium, which will be the focus of the first chapter.

Each example of architectural representation so far demonstrates several aspects of how representations were made and in what context. First, every work, aside from that of Vitruvius, was made in a monastic context.¹⁶⁴ This may be a result of survival rates of medieval manuscripts from medieval libraries, however, it still demonstrates that architectural representations were a common element in the monastic representative repertoire. Second, Adomnan's *De locis sanctis* demonstrates that plans and figures could be used to provide more information than the text. Furthermore, architecture has a tangible quality which was

¹⁶³ Stanford Anderson, 'Erinnerung in der Architektur – Memory in Architecture', *Daidalos*, 58 (1995), pp. 23-37, here pp. 28-30.

¹⁶⁴ Vitruvius' work appears in a number of monastic libraries throughout the Middle Ages. This point regarding the monastic nature of architectural representations is banal, I think it should be mentioned in order to be very clear about the types of sources treated in the rest of the thesis.

exploited by monastic authors, a fact which comes to light when examining representations as they appear in quadrivial works. This tangible quality is the essential property of architectural representations, and the topic is the focus of the following chapter.

We will now examine architectural representations in medieval quadrivial works, with a view to explaining why they appear in such large numbers. We will see that the characteristics which we have identified in early medieval representations are echoed in the quadrivial manuscripts, but they are mobilised for a very clear purpose – the explanation of abstract concepts.

Chapter One – Structuring the Quadrivium in Two Dimensions

Introduction

Throughout the early and central Middle Ages tables, frames, or grids with architectural elements, such as arches, columns, and capitals, frequently appear in pedagogical texts concerned either directly or indirectly with the liberal arts. This chapter will ascertain why architecture in particular was chosen as a common medium for this type of information. It will focus on didactic works, specifically those associated with the *quadrivium*, the higher division of medieval education in the liberal arts, comprising arithmetic, geometry, music, and astronomy and which use architectural representations to convey particular types of information.

A relatively large number of medieval quadrivial works included diagrams to help the reader understand and remember the content of the subject under discussion. About these diagrams Michael Evans writes, 'once one is familiar with the subject they illustrate, it can be seen that they frequently express the concept they embody more concisely than a written account could have done.'¹ Evans goes on to write that the diagrams 'impose order on everything.' He sees a relationship between the representative forms, in this case architecture, and the content of the text or the pedagogical motivations of the scribe. This chapter will examine Evans' claim that the drawings embody the written content they accompany, specifically in regard to architectural drawings. It will ask what it is about architectural drawings in particular which led to them being chosen as a diagram to accompany quadrivial texts. This relates to the original research question of the thesis that seeks to understand the nature of architectural drawings in didactic contexts by focusing on specific content – in the case of this

¹ M. W. Evans, *Medieval Drawings* (Feltham, 1969), p. 11.

chapter that is the quadrivium. By doing so, we will see that architectural representations help the author or scribe to 'impose order'; that the inherent quality of architecture is its ability to make abstract concepts more 'concrete,' and to move discussion of an abstract nature into the realm of the tactile and visual realms. This movement from abstractness to objectivity seems to have helped some students visualise and understand some of the subject matter in quadrivial subjects.

The examples of architectural representation were chosen for this chapter based on a number of factors. First, primacy was given to examples completed in the twelfth century because that is the wider focus of this thesis. Because a number of authors from the early Middle Ages continued to exert heavy influence on quadrivial education in the twelfth century it is necessary, at times, to examine examples from before that time. However, examples of architectural representations in twelfth-century manuscripts are always included and are the main focus. Second, many of the examples I have chosen, such as canon tables, geometry texts, and others are derived from texts which were common in the twelfth century. By including the examples I have, it will be shown that architectural representations were not restricted to obscure examples of didactic literature, but were included in manuscript witnesses to common educational works. By doing so, it will be shown that the images were a relatively common part of the higher levels of medieval education.

By focusing on this hierarchical nature of architecture the author or artist was able to index quadrivial data. In turn, the text which accompanies any architectural representation had a tendency to use particular types of terminology which will be discussed throughout this chapter. When considering architecture in the quadrivium we will discover that architectural frameworks were not passive or arbitrarily chosen containers for information, but performed an active role in the transmission and articulation of relatively sophisticated subjects. This role

identified architecture as a man-made object created out of the seeming chaos of the universe; in doing so, it reflected the texts in which it appears, texts which attempt to make sense out of the seemingly random elements of nature.

Before examining images, we can see that architectural language was used to articulate difficult concepts. During the Middle Ages architectural imagery provided a Latin vocabulary which enabled some authors, such as Boethius in the *De divisione*, to describe abstract or hypothetical concepts. Similarly, Saint Augustine (d. 430) used architectural imagery in *The City of God*, which was undoubtedly the most important medieval work of historical theology and was extant in many manuscripts.² Augustine contrasts two cities, the city of God, and the Earthly city, comparing the cities' qualities to make a wider point concerning Christianity's role in the late antique world.³ This same technique, of using architecture and cities to argue a point, continues into the twelfth century. Bernard of Clairvaux (d. 1153), likens a war between Christ and Satan as a battle between two cities which he identifies as Jerusalem and Babylon.⁴ Bernard plays on the biblical references and associations attached to particular cities; Jerusalem is the holy city, and Babylon, defined by the immoralities of its leader is connected with evil and sin.⁵ The cities, in this case, are stereotypes; examples which allow Bernard to effectively communicate the differences between good and evil in the form of inter-state war, a concept much more readily understood than spiritual warfare between two supernatural

² It has been argued that the Gothic cathedral signified the 'City of God', Laurence Hull Stookey, 'The Gothic Cathedral as the Heavenly Jerusalem: Liturgical and Theological Sources', *Gesta*, 8 (1969), pp. 35-41, here p. 39.

³ In the *City of God*, 'the notion of a city of God is contrasted [...] with the earthly city, which rejects God. He [Augustine] speaks of "the one of the heavenly city, which sojourns on earth, the other the earthly, which gapes after earthly joys, and grovels in them as if they were the only joys."' Gerald B. Guest, 'The Prodigal's Journey: Ideologies of Self and City in the Gothic Cathedral', *Speculum*, 81 (2006), pp. 35-75, here p. 53.

⁴ Bernard of Clairvaux, PL 183: 757-772.

⁵ *Inter Babylonem et Jerusalem nulla pax est, sed guerra continua. Habet unaquaeque civitas regem suum. Rex Jerusalem Christus Dominus est, rex Babylonis diabolus.* 'Between Babylon and Jerusalem there is no peace, but continuing war. Each state has its king: Christ the Lord is the king of Jerusalem, and the Devil is the king of Babylon.' Mette Birkedal Bruun, *Parables: Bernard of Clairvaux's Mapping of Spiritual Topography* (Leiden, 2007), p. 207.

beings. In both these examples architecture provides a heuristic model to communicate abstract concepts, the authors use analogies to clarify particular ideas which are difficult to express.

Similarly, some medieval authors invoked architecture and cities when discussing the seven liberal arts, and the uses to which they were put during the Middle Ages, as, for example, the arts were referred to as the 'pillars of wisdom,' alluding to their metaphorical support of an infrastructure directed toward knowledge.⁶ More specifically, in the twelfth century, Honorius Augustodunensis (d. c. 1140), in his *De animae exilio et patria*, identifies each individual subject of the liberal arts as a city in its own right, cities through which one must pass in order to move closer to God.⁷ Honorius writes, *Haec quippe via ducit ad patriam tendentes per [...] decem artes, et libros sibi adhaerentes, et quasi per totidem civitates et villas sibi servientes.*⁸ These cities and towns were never meant to be taken as literal structures but an expedient metaphor to describe the process and objective of learning. One travels through and between the cities in a specific order until the destination, that is wisdom, is reached.⁹ Hugh of Saint Victor (d. 1141) emphasised the structural image which architecture provides for the learning process. He wrote, 'just as you see that every building lacking a foundation cannot stand firm, so also is it in learning [...]. As you are about to build, therefore, lay first the foundation of history; next by pursuing the 'typical' meaning, building up a structure in your

⁶ A phrase taken from Prov. 9.1; 'Wisdom hath built herself a house, she hath hewn her out of seven pillars.' See, Jonas C. Greenfield, 'The Seven Pillars of Wisdom – A Mistranslation', *The Jewish Quarterly Review*, 76 (1985), pp. 13-20, here p. 13. Also, D.A. Russell, 'Arts and Sciences in Ancient Education', *Greece and Rome*, 36 (1989), pp. 210-226.

⁷ Honorius Augustodunensis, PL 174: 1241D-1246D. Honorius and this text will be discussed in detail in chapter three.

⁸ 'This path leads to home, stretching through the ten arts, and the books concerned with them, as though through as many cities or towns serving them.' PL 174: 1243B.

⁹ *His artibus quasi civitatibus pertransitis pervenitur ad sacram Scripturam quasi ad veram patriam, in qua multiplex sapientia regnat.* PL 174: 1245C. 'With these arts, it is like the coming to and passing through a city towards the sacred Scriptures, as if coming to the true fatherland, in which Wisdom rules the many.'

mind to be a fortress of faith. Last of all, however, through the loveliness of morality, paint the structure over as with the most beautiful of colours.’¹⁰ Hugh’s *Didascalicon* provided a curriculum for those wishing to learn the rudiments of knowledge which are required to understand Scripture. Hugh’s architectural imagery borrows directly from Gregory the Great (d. 604) and his *Moralia in Job*, reaffirming the expediency of the architectural metaphor in this case.¹¹ In a similar manner, this chapter argues that many quadrivial texts combine architectural vocabulary and images to provide a tangible or material scaffolding to contemporary didactic texts.

The enumeration of the liberal arts was defined by pre-Christian authors in their exploration of an ideal curriculum of education.¹² The model provided by the liberal arts was first described by Varro (d. 27 BC); however, the format he envisioned included the additional two subjects of medicine and architecture.¹³ In some parts of Europe the subjects of the liberal arts were not fixed, and contained alternative subjects or ways in which they could be divided.¹⁴ Educational concerns continued into the Christian era, demonstrated by Augustine in his *De doctrina Christiana*, where he describes the skills required by potential scriptural exegetes.¹⁵

¹⁰ Hugh of St. Victor, *The Didascalicon of Hugh of St. Victor*, trans. Jerome Taylor (New York; London, 1961), p. 138. Translations taken from this work unless noted.

¹¹ Paul Rorem, *Hugh of Saint Victor* (Oxford, 2009), p. 48; Pope Gregory I, ‘Epistola Reverendissimo et Sanctissimo Fratri Leandro Coepiscopo Gregorius Servus Servorum Dei,’ *Moralia in Job*, edited by Marcus Adriaen, CCSL 143 (Turnhout, 1979-1985), I. 3., p. 4.

¹² David L. Wagner, ‘The Seven Liberal Arts and Classical Scholarship’, in David L. Wagner (ed.), *The Seven Liberal Arts in the Middle Ages* (Bloomington, 1983), pp. 1-31.

¹³ *Ibid.*, pp. 15-16.

¹⁴ For example, in his *De animae*, Honorius includes the arts of physics, mechanics, and economics, making ten in total. Education in early medieval Ireland may also have been structured differently, Bruce Eastwood, ‘Astronomy in Christian Latin Europe, c. 500-1150’, *Journal for the History of Astronomy*, 28 (1997), pp. 235-258, here p. 237.

¹⁵ Augustine, *On Christian Teaching*, trans. R.P.H. Green (Oxford, 2008), p. 8. Extended discussion in Karl F. Morrison, ‘Incentives for Studying the Liberal Arts’, in David L. Wagner (ed.), *The Seven Liberal Arts in the Middle Ages* (Bloomington, 1983), pp. 32-57, here p. 33. On the purpose of the *De doctrina Christiana* Pierre Riché writes, ‘[Augustine] did not intend to establish guidelines for a school but rather to offer the Christian intellectual rules for scriptural interpretation in an abbreviated format.’ Pierre Riché, *Education and Culture in the Barbarian West: Sixth Through Eighth Centuries*, trans. John J. Contreni (Columbia, 1976), p. 9.

However, the list of the seven liberal arts is first enumerated in the Christian era by Martianus Capella (d. before 429) in his *The Marriage of Mercury and Philology*.¹⁶ This is an allegorical text which presents Philology preparing for her wedding to Mercury, when she receives seven handmaids, each representing one of the liberal arts. The work contains little useful information for the practice of the disciplines, and is instead concerned with the iconographical relationships and identifications associated with the hand-maidens.¹⁷ The subject of the liberal arts was common enough for Boethius to plan to write separate treatises on each of the subjects of the quadrivium, but his execution allowed him only to compose, while incarcerated, *De arithmetica* and *De musica*.¹⁸ Boethius was the first author to separate the subject of the seven liberal arts into the two categories of the trivium and quadrivium.¹⁹ His work strongly influenced the subsequent study of the liberal arts subjects into the twelfth century, and therefore will be discussed in detail during the course of this chapter. Finally, one of the most influential texts of the Middle Ages was Isidore of Seville's (d. 636) *Etymologiae*.²⁰ Amongst a range of topics, Isidore's work provides an overview of the seven liberal arts in some detail, drawing on a variety of sources; including those mentioned above. The popularity of these texts and the prestigious reputation of their authors meant that the liberal arts were

¹⁶ Martianus Capella, *Martianus Capella and the Seven Liberal Arts*, trans. William Harris Stahl, et al. (New York, 1971-1977).

¹⁷ This is discussed in more detail in F. Saxl, 'A Spiritual Encyclopaedia of the Later Middle Ages', *JWCI*, 5 (1942), pp. 82-142. More specific and later iconographical developments are discussed in Adolf Katzenellenbogen, *Allegories of the Virtues and Vices in Mediaeval Art: from Early Christian Times to the Thirteenth Century* (New York, 1964). Capella's section on astronomy, which will be discussed below, was found to contain more useful information than the other sections of the arts, as indicated by the addition of diagrams after the work was completed. Cf. Bruce Eastwood, Gerd Grasshoff, *Planetary Diagrams for Roman Astronomy in Medieval Europe, ca. 800-1500* (Philadelphia, 2004), p. 11.

¹⁸ Wagner, 'The Seven Liberal Arts', p. 20.

¹⁹ Boethius, *Boethian Number Theory: A Translation of the De Institutione Arithmetica*, trans. Michael Masi (Amsterdam, 1983), p. 71.

²⁰ Isidore of Seville, *The Etymologies of Isidore of Seville*, trans. Stephen A. Barney et al. (Cambridge, 2006), p. 14.

considered the ideal foundation for a later medieval curriculum. The application of the methods they describe would appear frequently in later manuscripts.

Before discussing the role of architecture in quadrivial texts it is important to first highlight that architecture was not the only organisational schema available to the artist or writer when conceiving accompanying diagrams to a text. By doing so it will become clear that the choice to include an architectural image was an intentional one. Two common non-architectural diagram types which effectively organise information into discrete units are *arbor* and *rotae* diagrams. A pedagogical purpose underlies the presence of many diagrams in medieval manuscripts; their presence is to act as a replacement, albeit a poor one, for the teacher.²¹ The text was not the only means through which the content came to be understood; instead the image complemented the text, and allowed the reader to understand complicated information via means other than the written text. They are heuristic figures, similar to Adomnan's inclusion of architectural diagrams in his *De locis sanctis*, as in O'Loughlin's reasoning discussed above. The pedagogical focus of experiencing and learning in different ways underpins this chapter, because the images and figures under discussion allow this activity to take place. Hugh of Saint Victor alludes to it in reference to his own experience of learning, 'I plainly showed what difference there is between an obtuse-angled, a right-angled, and an acute-angled triangle. Whether or not an equilateral parallelogram would yield the same area as a square when both of its sides were multiplied together, I learned by walking both figures and measuring them with my feet.'²² Hugh's experience is clearly one where reading, sight, and action or touch and play an important role in the formation of knowledge. It is in these modes of learning, described in this passage, that architectural representations in

²¹ Sicard, *Diagrammes Médiévaux*, p. 154.

²² Hugh of St. Victor, *Didascalicon*, p. 136.

didactic texts play a role. Each type of diagram brings abstract information into the domain of visual or tangible experience. Since this chapter is concerned with architectural drawings in particular it will be argued that these drawings are an act of physicalizing knowledge, making it tangible in a manner similar to Hugh's experience.

Rotae diagrams are defined by their circular form, but may contain different types of information. They are most commonly associated with Isidore of Seville's seventh-century work *De natura rerum*. This work attempts to describe the world within a scientific framework, one which 'organized knowledge proper for an educated man in seventh-century Visigothic Spain.'²³ In forty-seven chapters Isidore explains the appearance of the world, the sky, and the manner in which the stars and planets move.²⁴ Diagrams accompany many versions of the text, and in some cases appear associated with later texts to which they were not first attached, and indeed sometimes appear with no accompanying text.²⁵ *De natura rerum* became synonymous with the *rotae* diagrams at an early stage, and some manuscript copies simply refer to the text as the *liber rotarum* ('Book of circles').²⁶ Isidore refers to the diagrams as *figurae*, and to one as a *pictura*, implying that the diagrams were associated with the text from its inception. The first *figura*, and its reference in the text, outlines Isidore's explanation for the Egyptian months of the year (fig. 16).²⁷ Isidore writes: '*Cujus figura plerumque hujus vitae cursum intelligitur*.'²⁸ Through the *figura* the course of the moon [its *vita*] may be understood. The *figura* changes slightly in different manuscripts, but most show six concentric circles, which

²³ Wesley M. Stevens, 'The Figure of the Earth in Isidore's "*De Natura Rerum*"', *Isis*, 71 (1980), pp. 268-277, here p. 268.

²⁴ Isidore of Seville, *De Natura Rerum Liber*, ed. Gustav Becker (Amsterdam, 1967).

²⁵ Murdoch, *Album*, p. 52; also Evelyn Edson, 'World Maps and Easter Tables: Medieval Maps in Context', *Imago Mundi*, 48 (1996), pp. 25-42, here p. 27.

²⁶ Murdoch, *Album*, p. 52.

²⁷ The term *figura* will be discussed in detail in the following chapter.

²⁸ 'The course of this life is understood fully from the figure.' *PL* 83: 968B-C

are divided into twelve segments.²⁹ Murdoch explains the contents of each circle: the outermost circle in each segment contains the month; the next circle holds the 'first of each month in terms of the Roman kalends', then the name of the month again, followed by the word *diebus*; finally, the innermost circle contains the number of days in each of the relevant months according to the Egyptian calendar.³⁰ A slightly different *rota* diagram appears second in the *De natura rerum*, near the end of the chapter *De annis* (fig. 17). Here there is a circle broken into four parts each pointing towards the cardinal directions. Each segment contains the name of the direction, a season, and a property of that season (i.e., cold, moist, etc.). The diagrams appear in several formats during the Middle Ages but each keeps these main components.

These *rotae* diagrams have been described as evidently 'didactic,' and as 'teaching aids,' which take the place of modern slides or blackboards.³¹ The *rotae* figures in Isidore's *De natura rerum* have a separate transmission history from the text which they accompany. As Murdoch mentions, they frequently appear separately from the text, as isolated diagrams; moreover, the figures are sometimes placed alongside Bede's later text *De natura rerum* which originally contained no explanatory diagrams.³² Bede's *De natura rerum* gained an authoritative reputation, even though its lack of diagrams, or any sort of visual material, made it more difficult to understand than Isidore's *De natura rerum*.³³ As a result, Isidore's *rotae* were incorporated into Bede's text, thus making it easier to understand.³⁴ Bede's possible reluctance to use diagrams did not stop Alcuin (d. 804), who was strongly influenced by Bede

²⁹ Cf. Murdoch, *Album*, p. 53. The Egyptian calendar was made up of thirty days over twelve months and five additional days at the end of the year.

³⁰ Ibid., p. 53.

³¹ Bober, 'An Illustrated Medieval School-Book', p. 81.

³² Murdoch, *Album*, p. 52.

³³ Bober, 'Illustrated', p. 86.

³⁴ Edson, 'World Maps', p. 27.

in other matters, from emphasizing the advantages of including *figurae* within complicated texts, and especially the incorporation of *rotae* diagrams in astronomical texts.³⁵ Importantly, these diagrams, and the wider use of diagrams within didactic texts were not mere ‘visual aids,’ but a ‘visual instrument, artfully forged in a proven pedagogic tradition.’³⁶ We will see that while authors such as Bede did not use diagrams, others were fully committed to the possibilities of visual communication in order to teach a student efficiently. Images associated with didactic texts can have a pedagogic motive. The schematic diagrams were used depending on the particular context in which they appear; some students may not have required help from these *figurae*, while it would seem others depended on their presence in order to fully understand a complicated concept.

The *rotae* type diagram may also describe a physical place whilst simultaneously making use of allegorical representations, such as those in the ‘The Mystical Paradise,’ c. 1170-85 (Munich, Bayerische Staatsbibliothek, Ratisbon MS 454), where paradise is shown at the centre of the page containing the *agnus dei*, from where flow the four rivers of paradise. Between the rivers, in small circles, are depictions of temperance, fortitude, prudence, and justice (the four cardinal virtues). This sort of topographical *rota* diagram conflates elements of history with tropological praxis, educating the student by combining a place with more abstracted pieces of information. The use of *rotae* diagrams which combine representative forms with moral dogma became particularly associated with the University of Paris at the beginning of the thirteenth century.³⁷ They illustrate that visual exegesis is possible without

³⁵ Bianca Kühnel, *The End of Time in the Order of Things: Science and Eschatology in Early Medieval Art* (Regensburg, 2003), p. 106.

³⁶ Bober, ‘Illustrated’, p. 81.

³⁷ Henry, ‘The Pater Noster’, p. 101. Another excellent example of this is Oxford, Bodleian Library, MS Lyell 84. This is a roll which may have hung in a school-room to clarify the relationship between the seven deadly sins, and the beatitudes used to combat them. See, Albinia De La Mare, *Catalogue of the Collection of Medieval Manuscripts Bequeathed to the Bodleian Library Oxford by James P.R. Lyell* (Oxford, 1971), pp. 254-256.

the need for architectural representation, which implies that we are right to think that the presence of architecture in diagrams was a conscious choice by the author or artist and one which needs to be explained, or at least investigated.

Representational forms were also used to provide easy access to theories of knowledge.³⁸ Images such as the 'Moral Exposition of the Dove,' from the second half of the twelfth century (Frankfurt, Stadtbibliothek, MS Batt. 167, f. 66r) use a mixture of representative images, such as the dove in this case, with schematic lines, which link relevant parts of the exposition (fig. 18).³⁹ One of the most common representational images was the *arbor*, or tree diagram. One of Joachim of Fiore's *arbor* diagrams illustrates the three stages of Christ's predecessors, although articulating this properly was found to be difficult.⁴⁰ In several examples, the names of Christ's ancestors are written along the length of the main trunk, and two branches extend out on either side of that trunk at the point where Jacob and Isaac are written (fig. 19). The *arbor* structure allows for a comprehensive presentation of a single concept, located in the roots of the tree. This initial concept can then be broken up into separate elements, some of which are only indirectly connected to the root. The form allows for a hierarchical structure to be clearly displayed, but also gives freedom to establish lateral relationships between concepts which are defined by *tituli*. The most common and clearest application of this type of schematic representation derives from the 'Tree of Jesse' image, which illustrates the generations of Christ.⁴¹ This is most famously used in the stained glass of Abbot Suger's renovation of the abbey church at Saint Denis, where it was established in the

³⁸ By 'representational' I mean an image or figure which takes the form of an object from the real world and attempts to represent it on a surface. *Rotae* diagrams are non-representational because typically they do not take an object from life, or a copy of such an object in another medium, as their model.

³⁹ Cf. Katzenellenbogen, *Allegories*, pl. XXXVII, no. 62.

⁴⁰ Marjorie Reeves, 'The 'Arbores' of Joachim of Fiore', *Papers of the British School at Rome*, 24 (1956), pp. 124-136.

⁴¹ The book of Isaiah describes the genealogical descent of the messiah, 'And there shall come forth a rod out of the root of Jesse, and a flower shall rise up out of his root.' (Is. 11.1).

south bay (fig. 20).⁴² This successional form allows for the dimension of time to be applied to one's reading of the figure, moving through the generations until one reaches Christ.⁴³ The description of the generations in the Gospel of Matthew is reinforced by the diagram which is depicted in a clear, schematic form.⁴⁴

Annemieke Verboon has examined the use of diagrams within texts concerned with logic, natural philosophy, medicine and psychology from the thirteenth to the sixteenth centuries in the universities of Paris, Oxford, and Prague.⁴⁵ Part of her work focuses on the 'Tree of Porphyry,' which clarifies the logical relationships described in Porphyry's (d. c. 305) *Isagoge*. This text provided an introduction to the categories of substances found in Aristotle's *Topics*, offering the only known discussion of the work until the twelfth century. The tree itself is often depicted as a physical tree, taking advantage of the clear hierarchical system the *arbor* schema provides. However, the first example Verboon has been able to discover of Porphyry's system is an architectural diagram. It is found in the margins of an eleventh-century teaching manuscript.⁴⁶ The *tituli* appear in two rows with a gable shown on top, surmounted by a cross, indicating that the initial scheme applied to the information in Porphyry's tree was architectural (fig. 21), and suggests that the forms of diagrams were relatively fluid during the early stages of their creation. Verboon's purpose is to identify the reasons why particular diagrams were chosen for pedagogical texts, an aim which overlaps with that of this thesis. Verboon however, focuses on the later Middle Ages, and emphasises the subjects of the trivium. One of Verboon's purposes is to dispute the statement that 'the subject-matter of the [Boethius'] *De*

⁴² Abbot Suger, *Abbot Suger on the Abbey Church of St.-Denis and its Art Treasures*, trans. Erwin Panofsky (Princeton, 1979), p. 73.

⁴³ John North, 'Diagram and thought in medieval science', in Marie-Therese Zenner (ed.), *Villard's Legacy: Studies in Medieval Technology, Science and Art in Memory of Jean Gimpel* (Aldershot, 2004), pp. 265-87, here p. 271.

⁴⁴ Mt. 1.1-2.

⁴⁵ Annemieke Rosalinde Verboon, 'Lines of Thought: Diagrammatic Representation and the Scientific Text of the Arts Faculty, 1200-1500' (unpublished Ph.D thesis, Leiden University, 2010).

⁴⁶ Cologne, Dombibliothek, MS 191, f. 2v. The image is reprinted in Verboon, 'Lines', p. 47.

arithmetica – with the exception of author portraits and the personification of Arithmetic – does not lend itself to illustration.⁴⁷ Verboon instead states that ‘visual representations in scholarly texts are to be found especially in medieval masters’ and students’ schoolbooks.’⁴⁸ This statement is certainly the case within the framework of Verboon’s study; I would also argue that architectural imagery lends itself to pedagogic ends in medieval schoolbooks.

Many other types of figures are used for didactic purposes, from the human hand to the wings of the seraph which were used to organise and possibly to aid memorisation; however, for now it is enough to note that despite the various representational options available, architecture is particularly common.⁴⁹ The images under discussion appear within a scientific context, hence they need to be discussed under the framework of previous scholarship which has already examined the relation between diagram and text. John E. Murdoch’s study of medieval scientific diagrams has ‘provided one of the earliest and most trenchant analyses of the logic of historical epistemic images.’⁵⁰ Murdoch attempts to ‘question the types of “visual aids” which accompanied the written works of early science.’⁵¹ These types conform to particular stylistic and motivational criteria, including *rotae*, and organisational diagrams, where each diagram’s purpose was to aid ‘proper comprehension of the proof, theory or concept underlying the text.’⁵² The scientific and pedagogical interest of text and image are placed side by side, where no differentiation is made between the two; an assumption partly encompassed by the term ‘epistemic image.’⁵³ Other than an example of a

⁴⁷ Diane Bolton, ‘Illustrations in Manuscripts of Boethius’ Works’, in Margaret Gibson (ed.), *Boethius: His Life, Thought and Influence* (Oxford, 1981), pp. 428-437, here p. 433.

⁴⁸ Verboon, *Lines*, p. xii.

⁴⁹ See examples in Mary Carruthers, Jan M. Ziolkowski (eds.), *The Medieval Craft of Memory: an Anthology of Texts and Pictures* (Philadelphia, 2004).

⁵⁰ Christoph Lüthy, Alexis Smets, ‘Words, Lines, Diagrams, Images: Towards a History of Scientific Imagery’, *Early Science and Medicine*, 14 (2009), pp. 398-439, here p. 400.

⁵¹ Murdoch, *Albums*, p. x.

⁵² *Ibid.*, p. xi.

⁵³ Lüthy, Smets, ‘Words’, p. 400.

canon table, Murdoch includes only one example of an architectural diagram, which is found in London, British Library, MS Harley 4348, f. 26v, in a text strongly reminiscent of Honorius Augustodunensis' *Clavis Physicae* (fig. 22).⁵⁴ In this image Honorius 'considers the combinations of fire, air, earth, and water in groups of two, three and four.'⁵⁵ Murdoch makes few remarks regarding the presence of architectural tables in a scientific context, only that the 'colonnade setting [...] reminds one of canon tables for the Gospels [...]. Perhaps they were consciously modelled on them.'⁵⁶ Likening architectural imagery to the canon tables in this manner demonstrates the importance and ubiquitous nature of the canon tables and their possible influence on a range of works. However, Murdoch never considers the range of architectural imagery in medieval manuscripts and in scientific texts specifically, hence he proposes the possibility that all architectural representations in similar texts were modelled on those of the canon tables. Murdoch does not consider the alternative: that architectural representations are an independent manifestation of organisational schema in didactic works. This chapter argues that architectural images in didactic texts shared similar forms with Gospel canon tables because they also shared a function; namely the organisation of abstract information within an image which drew on monumental, and hence tangible, forms.

Before examining the quadrivial texts, we should highlight an important two-dimensional analogue to the types of drawings which appear in the didactic works. One twelfth-century discussion concerned with combining data with two-dimensional organisational schema provides some context and overview for similar works. Hugh of Saint Victor's, *De tribus maximis circumstantiis gestorum* is not associated with a clearly defined

⁵⁴ Honorius Augustodunensis, *Clavis Physicae*, edited by Paulo Lucentini (Rome, 1974). The two texts are not identical, and Lucentini only publishes the first part of the text.

⁵⁵ Murdoch, *Albums*, p. 31.

⁵⁶ Ibid. The architectural frameworks which appear as canon tables will be discussed in the following section on music.

architectural representation, but it does use similar two-dimensional language and figures to those discussed throughout this chapter.⁵⁷ The work was 'composed as a preface to a chronology of biblical history' created for the students of Saint Victor.⁵⁸ At the beginning Hugh discusses the importance of memory and its relation to understanding: 'knowledge is a treasury and your heart is a strongbox [...]. In the treasure house of wisdom are various sorts of wealth.'⁵⁹ Hugh describes three methods through which the memory functions: number, location, and occasion.⁶⁰ Concerning the first Hugh writes, 'Learn to construct in your mind a line [of numbers] numbered from one on [...], become accustomed to quickly turning your mind there where its sum is enclosed [...]. For example, when you hear ten, think of the tenth place.'⁶¹ Having memorised and become comfortable with this number line, Hugh explains how it may be used to learn the psalms. 'I learn them all [the psalms] in order so that I know which is the first, which the second, which the third, and so on. I then place them all by order in my heart along my numerical line, and one at a time I designate them to the seats where they are disposed in the grid.'⁶² When the students have assigned the beginning of each psalm its appropriate number, they should turn their attention to the individual psalms. 'I then devise the same sort of scheme for each separate psalm, starting with the words of the verses just as I did for whole Psalter starting with the first words of the psalms, and I can thereafter easily retain in my heart the whole series one verse at a time [...]. I have reduced a large amount of material to such conciseness and brevity.'⁶³ Hugh's envisioned 'grid-like' structure reflects the

⁵⁷ Hugh's work and that of the canon house of Saint Victor will be discussed in detail in the following chapter. For a brief outline of the treatise's context see, Carruthers, *Book of Memory*, pp. 100-101.

⁵⁸ Carruthers and Ziolkowski, *The Medieval Craft*, p. 32. Translations of the text are taken from this unless stated otherwise. Latin edition found in William M. Green, '*De tribus maximis circumstantiis gestorum*', *Speculum*, 18 (1943), pp. 484-93.

⁵⁹ Carruthers and Ziolkowski, *The Medieval Craft*, p. 33.

⁶⁰ *Ibid.*, p. 36. Carruthers briefly discusses these methods on p. 32.

⁶¹ *Ibid.*

⁶² *Ibid.*, p. 37.

⁶³ *Ibid.*, pp. 36-37.

two-dimensional nature of the architectural representations reviewed in this chapter. They are formed with lines, and the information given order by envisioning a grid.

Paris, BnF, MS lat. 15009 contains the text of Hugh's *De tribus maximis circumstantiis gestorum* and is accompanied by a series of tables running from ff. 3v-17v (fig. 23).⁶⁴ The table begins with an outline of the stages of creation ordered along the vertical axis, indicated by the term 'creation' set within an arch at the top of the second column. The six days of creation and what occurs on those days is then listed; these are grouped into six overlapping stages, also indicated by arches set within the first and fourth columns.⁶⁵ This outline of creation is then separated from the information set below it, which Hugh indicates with the captions: 'years since creation,' 'patriarch,' 'became father, aged' and 'years lived.' Mary Carruthers emphasises the importance Hugh places on memory in his discussion of the table.⁶⁶ Hugh also mentions the importance of the disposition of the material which would aid recall of the material, writing, 'it is necessary to retain it [the 'good foundation the table provides'] in memory and by diligent retracing to have it customary and well known [...] by a suitable distribution according to their place, date, and person.'⁶⁷ For Hugh the act of ordering the material at hand is an important step in the process of remembering. Carruthers also emphasises the likeness of the image to contemporary canon tables, using similar architectonic features to order the material.⁶⁸

⁶⁴ A facsimile and translation appears in Carruthers and Ziolkowski (eds.), *Anthology*, figs., 1.2 and 1.1.

⁶⁵ Those in the first column are given as participles, in order from the top: 'created', 'ordained', and 'decorated.' Those in the fourth column are: 'void', 'matter', three appear in the final arch, 'sky, water, air, land.' Ibid. fig. 1.2.

⁶⁶ Ibid., p. 33.

⁶⁷ Ibid., p. 39, *Verumptamen hoc ita memoriter retinere oportet et assidua retractatione domesticum et notum habere, ut promptus sit ad omnia audita cor suum aptare, et ea quae hic didicerit ad omnia quae postmodum audierit secundum locum et tempus et personam congrua distributione assignare.*

⁶⁸ Mary Carruthers. *The Book of Memory: A Study of Memory in Medieval Culture*, 2nd ed (Cambridge, 2008), p. 118.

Mnemonic techniques are also given in the Pseudo-Ciceronian *Rhetorica ad Herennium*, Carruthers describes these as involving entire rooms and buildings to hold the objects of memory.⁶⁹ Hugh, however, uses only a series of lines and grids, which act as an indexing system for material already remembered. He does not describe the process as a technique involving three-dimensional objects, only a series of two-dimensional shapes. Underlining this reliance on simple geometric shapes is Hugh's language, which retains a geometric tone and vocabulary. For example, he writes, *Memoria enim semper gaudet et brevitate in spatio et paucitate in numero [...] ut quod animus spatio comprehendere/non potest saltem numero comprehendat*.⁷⁰ In Carruthers' translation the term *spatio* is rendered as 'length.' One possible reason for translating it this way stems from the infrequent use of the term *spatio* to mean 'space' or 'area,' when *locus* is a much more commonly used term.⁷¹ *Spatio*, in contrast, is almost exclusively used with respect to geometric objects, and, as we will see, to describe a figure or diagram. Hugh uses the language of length (*longitudo*) and width (*latitudo*) to describe the diagram under discussion, using the spatial qualities of these terms to orientate the viewer.⁷² Again, these words reflect geometric language used to represent two-dimensional objects, and especially architecture in twelfth-century didactic works. This chapter presents such diagrams, outlining the parallel use of architectural language and representations to provide the student and reader with another means to understand the content under discussion. By orientating the reader through references to length and width,

⁶⁹ Ibid., pp. 89-93.

⁷⁰ Green, 'De tribus', p. 490. Carruthers translates these passages as: 'For the memory always rejoices in both brevity of length and paucity of number [...] so that what the mind could not comprehend in a single expanse it can comprehend at least in number.' Carruthers and Ziolkowski, *The Medieval Craft*, p. 38.

⁷¹ Edith Dudley Sylla, 'Physics', in F.A.C. Mantello, A.C. Rigg (eds.) *Medieval Latin: an Introduction and Bibliographical Guide* (Washington D.C., 1996), pp. 355-362, here p. 358.

⁷² For example, *Siquidem in archa cordis tempus et numerus longitudinem metiuntur, aream in latitudinem expandit locus*. Green, 'De tribus', p. 491. 'Accordingly time and number are measured in length in the box of the heart, the area expands in width.'

the diagrams create a tangible object which may be interacted with and assimilated by the student during the process of learning, aiding memorisation by creating an organisational principle.

The two-dimensional nature of many diagrams is made clear by their use in arithmetic texts, and for that reason I shall discuss arithmetic first. The second section will then consider geometry, a subject which has strong and sustained links with architecture and architectural representations. Next, I shall discuss the Gospel canon tables in relation to music, based on a link made clear by one particular medieval commentator. Finally, we shall examine astronomical works: in comparison to the other quadrivial texts, many of these texts lack architectural drawings, and the reason for this absence is investigated. All these examples present architecture as two-dimensional images which can be scanned and interpreted as a simple framework for holding information, using only 'length' and 'width.' However, the architectural qualities of the diagrams offer the writer and reader a medium through which abstract information becomes ordered, tangible, and intelligible. Architecture acts as a manifestation of man-made order created out of a seemingly chaotic universe. Many of the drawings discussed here look remarkably similar to one another, underlining the argument proposed, that by examining the two-dimensional properties of these architectural representations the orderly nature of the architectural diagram comes to the fore, fashioned and defined by a language of its own. Architectural imagery provides a set language and series of images which makes abstract subject-matter more tangible to its medieval students.

Arithmetic

Number is the basis of the quadrivium, and for that reason it will be discussed first here. By discussing arithmetic first we establish a solid foundation for the subsequent discussion of geometry, music, and astronomy. We will see that medieval arithmetic, for the most part, considered number theory, rather than the operations for which numbers were used, which were considered to belong to the field of 'logistics' instead.⁷³ The figures which appear alongside arithmetical texts, and indeed the other quadrivial subjects, are two-dimensional drawings. By this I mean that they are constructed and conceived of as grid-like structures used to frame and organise information, similar to Hugh of Saint Victor's system used to organise and index the Psalms. Indeed, many accompanying texts and captions orientate the reader in two dimensions, asking him to refer to the length (*longitudo*) or width (*latitudo*) of a drawing. The most consistent application of arithmetical techniques is to attain the date of Easter using tables of numbers called the *computus* tables. There are examples of *computus* tables presented within architectural frameworks, and at least one orientates the reader by means of length and width. I will consider each of these points within this section.

The period from late antiquity to the twelfth century has been described as a mathematical 'dark age;' however, mathematics and its related disciplines developed within the narrow context of Christian exegesis.⁷⁴ Augustine sets out the fields of knowledge required by those who write and speak about Scripture. Any lack of knowledge in these disciplines may make 'unintelligible many things that are said figuratively and mystically in Scripture.'⁷⁵ In this

⁷³ Evgeny A. Zaitsev, 'The Meaning of Early Medieval Geometry: From Euclid and Surveyors' Manuals to Christian Philosophy', *Isis*, 90 (1999), pp. 522-553, here p. 527.

⁷⁴ Morris Kline, *Mathematical Thought from Ancient to Modern Times* (3 vols., Oxford, 1990), I, p. 202. See also: Carl B. Boyer, Uta C. Merzbach, *A History of Mathematics*, 2nd Ed (New York, 1989), and John Fauvel, Jeremy Gray, *The History of Mathematics: A Reader* (Milton Keynes, 1990).

⁷⁵ *Ibid.*, p. 45.

sense, Augustine bypasses any demand for developing innovative mathematical methods which help determine the laws of nature, because the available methods already suffice for the exegesis of Scripture. This knowledge helps explicate 'abstruse analogies,' but not to help answer particular number-based problems.⁷⁶ Number theory was important for Augustine because it explained numbers in terms of qualitatively perceived positive and negative values, which could then be re-interpreted into Scripture. Martianus Capella's early fifth-century work *De nuptiis Philologiae et Mercurii* also provided a strictly allegorical presentation of arithmetic without any explanation of mathematical operations.⁷⁷ Despite this, 'the book must be regarded as the key work in the history of education, rhetoric, and science during this period.'⁷⁸ The deeply allegorical nature of Martianus' work marks it as fundamentally different from Augustine's but both shared an emphasis on the allegorical aspects of number only, or in essence, on numerology. To determine the properties of numbers, and their identifications as particular types of numbers, even, odd, or perfect, Boethius' *De institutio arithmetica* provided some answers, and became the foundational text on the subject until the twelfth century.⁷⁹ Boethius' work is a translation of Nichomachus' second-century work of the same name.⁸⁰ *De institutio arithmetica*, however, does not include descriptions of mathematical problems, or original ways of developing the discipline. Instead it considers, almost exclusively, number theory.⁸¹ Number theory examines 'the properties of the integers and rational numbers' to

⁷⁶ Ibid., p. 46.

⁷⁷ Capella describes Arithmetic as having ten rays emanating from her brow, and 'a robe concealing the operations of universal Nature covered her manifold and intricate undergarment.' Martianus Capella, *Seven Liberal Arts*, pp. 274-275.

⁷⁸ Ibid., p. 22.

⁷⁹ Boethius, *Boethian Number Theory*. All translations are taken from this book, except when noted.

⁸⁰ A. George Molland, 'Mathematics', in David C. Lindberg, Michael H. Shank (eds.), *The Cambridge History of Science* (Cambridge, 2003), pp. 512-531, here p. 513.

⁸¹ Boethius, *Boethian Number Theory*, p. 11.

determine patterns, and hence is not strictly concerned with applied mathematics or logistics.⁸²

Particular details of Boethius' work are discussed in more detail below.

Later, during the Carolingian period, which comprises the middle section of Carl Boyer's mathematical 'dark ages,' Alcuin's work on arithmetical problems articulated his desire to use problems to educate students.⁸³ In the context of the development of mathematics in the West Alcuin's work represents an example of how the subject remained important throughout the period, and also indicates some interest in using mathematics to solve real-life problems. Boyer, amongst others, identifies the next major figure in medieval mathematics as Gerbert of Aurillac (d. 1003), who later became pope Sylvester II.⁸⁴ Gerbert published works on astronomy and music, but is also credited with introducing the Hindu-Arabic numbering system into the West.⁸⁵ In terms of practical mathematics he wrote about the use of the abacus in accounting procedures. The use of this tool would become an important factor and subject in both medieval education and texts.⁸⁶ Gerbert's work acts as a catalyst for the abacus' inclusion in medieval schools and texts. His interest in Hindu-Arabic mathematics heralds an influx of translated texts from the Arabic-speaking lands of Spain and the Middle East, helping to bring this relatively stagnant period in the practice of mathematics to an end.

Despite the few ostensible developments in mathematics during the early Middle Ages, it can be demonstrated that Alcuin and Boethius' texts were related, in some way, to architecture. Alcuin's *Propositiones ad acuendos iuvenes*, mentioned above, presents a set of

⁸² H.E. Rose, *A Course in Number Theory* 2nd ed. (Oxford, 1994), p. ix. The importance of relationships between integers is spelled out in Kenneth H. Rosen, *Elementary Number Theory and Its Applications*, 4th ed. (Reading, Mass., 2000), p. 1.

⁸³ The work *Propositiones ad acuendos iuvenes* is discussed in the following page.

⁸⁴ Nancy Marie Brown, *The Abacus and the Cross: The Story of the Pope who Brought the Light of Science to the Dark Ages* (New York, 2010), p. 6.

⁸⁵ Boyer, Merzbach, *A History* (1989), p. 281.

⁸⁶ This is especially the case for England and Northern-France, c.f. Gillian R. Evans, 'Schools and Scholars: The Study of the Abacus in English Schools C. 980-C.1150', *The English Historical Review*, 94 (1979), pp. 71-89.

fifty-three mathematical problems. The text may not be by Alcuin, although he does make reference to writing a set of problems, which he created for the development of the arithmetical ability of students.⁸⁷ The popularity of these problems would seem to be relatively certain with twelve extant manuscripts, the earliest from the ninth century.⁸⁸ The text also became associated with the works of Bede, whose influence, in relation to the quadrivium especially, was strong up to the twelfth century.⁸⁹ The problems in the text strike a balance between the abstracted number theory of Boethius, and applied problem solving. Some questions are quite abstract and have no obvious real-life value. For example, problem fourteen presents the following question: 'An ox ploughs a field all day. How many footprints does he leave in the last furrow?'⁹⁰ Other questions are more practical in nature, and while conforming to a wider genre of questions, knowledge of how to resolve such problems is inherently useful as, for example, in determining the number of small cuts of cloth that may be gained from a larger one.⁹¹ Alcuin presents architectural problems to help sharpen the minds of his students. For example, problems twenty-seven, twenty-eight, and twenty-nine ask students to determine how many houses one may fit into three different shaped towns (*civitates*). Problems thirty and thirty-seven are also indebted to what could have been real-life architectural problems, or certainly those posed at the beginning of a building project. Problem thirty asks 'A basilica is 240 feet long and 120 feet wide. It is paved with paving stones

⁸⁷ John Hadley, David Singmaster, 'Problems to Sharpen the Young', *The Mathematical Gazette*, 76 (1992), pp. 102-126, here p. 103. Translations are taken from this version unless stated.

⁸⁸ Menso Folkerts, 'Die Älteste Mathematische Aufgabensammlung in Lateinischer Sprache. Die Alcuin Zugeschriebenen Propositiones ad Acuendos Iuvenes,' *Österreichische Akademie der Wissenschaften, Mathematisch-Naturwissenschaftlichen Klasse: Denkschriften*, 116 (1978), pp. 15-80.

⁸⁹ Charles Jones argues that the attribution of the *Propositiones* to Alcuin may be incorrect, but it most certainly cannot have been written by Bede: Charles W. Jones, *Beda's Pseudepigraphia: Scientific Writings Falsely Attributed to Bede* (New York, London, 1939), pp. 51-52.

⁹⁰ Hadley, Singmaster, 'Problems', p. 110.

⁹¹ *Ibid.*, p. 108.

one foot 11 inches long and 12 inches, that is one foot, wide. How many stones are needed?’⁹²

Problem thirty-one asks a similar question; asking the student to determine how many large wine casks could be fitted into a wine cellar, a question made more complicated by including a path in the middle of the room.⁹³ Problem thirty-seven offers another angle on a potential real-life situation with an architectural context. The text reads:

A man wanting to build a house contracted with six builders [*artifices*], five of whom were master builders [*magistri*], and the sixth an apprentice [*discipulus*], to build it for him. He agreed to pay them a total of 25 pence a day, the apprentice to get half the rate of a master builder. How much did each receive a day?⁹⁴

Aside from the interesting use of master/apprentice terminology, this problem reflects another type of mathematical problem. The patron has a strict budget with which to pay a set number of workmen, and he must determine the cost of each mason per day. These sorts of practical problems serve to demonstrate that the statements of Boyer and others, regarding the exclusive interest in abstracted numerology during this period, are not strictly correct.

Problem twenty-seven reads,

*Est civitas quadrangula, quae habet in uno latere pedes mille centum; et in alio latere pedes mille; et in fronte pedes DC, et in altera pedes DC. Volo ibidem tecta domorum ponere, sic, ut habeat unaquaeque casa in longitudine pedes XL, et in latitudine pedes XXX. Dicat, qui uelit, quot casas capere debet.*⁹⁵

⁹² Ibid., p. 117. The answer is 15,120. This would have been a very useful and worthwhile equation to know. The transport of materials from a quarry or artisan was the most expensive aspect in any medieval building project, and knowing how many stones were needed would have made significant savings in case of over-estimating the actual requirements.

⁹³ Ibid. This is a problem that the creator of the St. Gall plan would have faced, as he placed a wine cellar to the west of the cloister with a track running down the middle of it.

⁹⁴ Ibid., p. 119.

⁹⁵ ‘A four-sided town measures 1100 feet on one side and 1000 feet on the other side, on one edge 600 and on the other edge 600. I want to cover it with roofs of houses, each of which is to be 40 feet long and 30 feet wide. How many dwellings can I make there?’ Ibid., p. 115.

At first Alcuin does not ask the student to determine how many houses one can fit within the city walls; instead, at first he asks the student how many 'roofs of houses' can be fitted into the area. Alcuin must have in mind one of several meanings. It is possible that he uses roofs as a metonym for the houses as a whole. However, it is also possible that Alcuin conceives the problem as visual in nature, that the problem and solution could be represented as a plan. The roofs of the houses must overhang the underlying structure, and hence the roofs are the only part of a building which would be seen from above. So when inserting the houses into the city walls, the only part of the house one could represent would be the roof.⁹⁶ While there are no plans or diagrams associated with the *Propositiones*, the Saint Gall plan suggests that architectural plans were used at this time, and may hint indirectly at a possible visual solution on Alcuin's part.

Alcuin's work was not the most important arithmetical work from the early Middle Ages; instead, Boethius' *De institutione arithmetica* represents the most common arithmetical treatise to appear in medieval manuscripts.⁹⁷ The work is accompanied by a series of figures which illustrate particular points in the text; Boethius uses two-dimensional language to orientate the reader around figures, discusses the purpose of including the figures, and – in at least one case – one figure includes architectural imagery. The diagrams which accompany *De institutione arithmetica* were an integral part of the manuscript tradition and comprise part of an effective pedagogical strategy for the author, with several references made to them over the course of the work.⁹⁸ It seems clear that the purpose of these diagrams is to elucidate

⁹⁶ Alcuin gives the answer as 520, however, only 519 can be inserted according to Hadley and Singmaster, p. 115. I have not been able to improve on this number.

⁹⁷ On the importance of Boethius' legacy in the subject of music and arithmetic, see Marenbon, *Boethius*, p. 164. The relatively large number of Boethius' work in medieval manuscripts up to the twelfth century is also indicated in M.T. Gibson and Lesley Smith (eds.), *Codices Boethiani: A Conspectus of Manuscripts of the Works of Boethius* (London, 1995), p. 23.

⁹⁸ Boethius uses the term *descriptio* to refer to the diagrams associated with the text. Boetii, *De Institutione Arithmetica: Libri Duo, De Institutione Musica Libri Quinque, Accedit Geometria quae Fertur Boetii*, edited by

difficult points from the text and to visually clarify potentially confusing ideas. For instance, in book two chapter seventeen Boethius states that 'In order that these data may be more easily grasped at sight, the numbers of these forms will be put in the following diagram.'⁹⁹ In this section Boethius identifies the diagram's alternative mode of communication, through the eyes, as a valid manner for interpreting and understanding sophisticated facets of medieval number theory. In essence Boethius validates the inclusion of diagrams *in toto*. Boethius underlines this point near the beginning of the work, writing that 'I have even used formulae and diagrams [*descriptiones*] for greater clarity in matters.'¹⁰⁰ Boethius' diagrams fulfil a didactic purpose, similar to Adomnan's drawings for his *De locis sanctis*, because they visually clarify points of the text.

Boethius' first major diagram seeks to explore the relationship between sets of 'even times even' and 'even times odd,' number series (fig. 24).¹⁰¹ The diagram appears in the majority of *De institutione arithmetica* manuscripts and corresponds to the description given in the accompanying text.¹⁰² The diagram is constructed of a central four-by-four grid – making sixteen in total – compartments.¹⁰³ The horizontal rows show a series of 'even times even' numbers, and the vertical columns show the 'even times odd' numbers. Extending from each side of the grid there are a series of arches which connect one compartment of the inner

Godofredus Friedlein (Leipzig, 1867), I. 12, p. 28. This is the same term Boethius uses when offering a 'descriptive example', Boethius, *Boethian Number Theory*, I. 9., p. 80.

⁹⁹ *sed quoniam facilius oculis subjecta retinentur, supradictarum formarum numerositas in subteriore descriptione ponatur*, Ibid., II, 17, p. 140.

¹⁰⁰ Boethius, *Boethian Number Theory*, p. 67.

¹⁰¹ 'Even times even' numbers are those when divided by 2 the result is also divisible by 2 and so on until 1. For example, 128, 64, 32, 16 etc. 'Even time odd' numbers are even numbers that when divided into even parts will produce an odd number. The series is generated by multiplying an odd number by two. Figure 31 illustrates the figure in the twelfth-century manuscript Oxford, Bodleian Library, MS Saville 20, f. 11r.

¹⁰² Boethius entitles chapter twelve of the first book as, *Superius igitur digestae descriptionis haec ratio est*. Boethius, *De Institutione Arithmetica*, I. 12., p. 28.

¹⁰³ A tenth-century unfinished copy of the text provides the diagrams without inserting the numbers, leaving only a sparse grid, indicating the manner in which the drawing was constructed, St. Gall, Cod. Sang. 248, f. 10v.

grid with other compartments of the same grid. The vertical latitude column on the left demonstrates that in a set of four, or 'even by even' number sequence, the two middle terms added together will result in the same sum as adding the two extremes. In this case, the left latitude contains the numbers 12, 20, 28, 36. The two middle terms added (20+28) result in 48, which is the same result when one adds the two extremes, 12 and 36. This relationship is made explicit by including the result in the outermost encompassing arch on the left. Boethius' diagram uses round arches, forms which are reminiscent of ninth-century architectural forms, to show that particular numbers may be grouped together.¹⁰⁴

Although the diagram does not contain architectural elements, its description in the text and some of its *tituli* use architectural language.¹⁰⁵ Importantly, Boethius uses the terms *latitudine* and *longitudine* to describe the spatial orientation of the diagram.¹⁰⁶ *Longitudine* is written at the top and bottom of the diagram and describes the 'even times even' numbers, and their placement along the horizontal compartments of the grid, while *latitudine* does the same for the 'even times odd' numbers along the vertical columns. By orientating the reader through reference to width and length, and reinforcing this system by the *tituli* on the diagram, Boethius has created a two-dimensional structure to clarify concepts within the text.

Boethius establishes a two-dimensional structure to orientate his reader around the figures included with and referenced in the text. This two-dimensional structure was subsequently used in other works and in relation to other diagrams which will be discussed

¹⁰⁴ Alternatives for grouping analogous elements are possible, such as the crescent moon shape used by Hugh of St. Victor in his *Chronicon*.

¹⁰⁵ A tenth-century elaborate and highly decorative copy of *De institutione arithmetica* provides some architectural details such as capitals at the base of the arches, Bamberg, Staatsbibliothek, Msc. Class. 5, f. 28r (fig. 25). The explicit use of architectural details in this context seems to be relatively rare, and should not be taken as typical for this particular diagram. While it does provide an interesting example, its rarity means it is not discussed further in the context of this thesis.

¹⁰⁶ Boethius orientates the reader by referring to the length and width of the diagram as well. For example, *Si ad latitudinem respicias*, 'if you look at the latitude', and, *si ad longitudinem respicias*, 'if you look at the longitude.' Boethii, *De Institutione Arithmetica*, I. 12., pp. 28-29.

below. Boethius' imposition of a spatial dimension on his diagram relies and plays on the author's identification of the *descriptiones* with textual and visual representations of architecture. The terms *latitudine* and *longitudine* are frequently used in descriptions of architecture in Scripture, many of which go into great detail about the length and width of particular buildings.¹⁰⁷ Indeed, when Boethius comes to describe relative and equal proportions of numbers and quantities he uses the biblical measurement of the cubit, as well as the foot.¹⁰⁸ The same language is used in Alcuin's *Propositiones* to describe the widths of the buildings in problem twenty-seven, quoted above. By orientating the reader through references to length and width only, Boethius simultaneously assumes that the drawing is two dimensional and possesses the qualities of space or area.

In terms of the diagram's similarity with visual examples, the square shape of the grid pattern and its diagrammatic style is similar to architectural plans from the early and central Middle Ages. Most notably the Saint Gall plan's cloister, and even the earlier *formae urbis* of Rome, as discussed in the introduction. The primary similarity is the manner in which arches are represented in each of these examples. As discussed in the introduction, most medieval architectural drawings conflate the plan and elevations, with the arches shown in elevation, despite the primary view being from above. The cloister of the Saint Gall plan clearly shows this technique, where the arches running along the perimeter of the cloister are shown as if

¹⁰⁷ For example, Rev. 21:16, *et civitas in quadro posita est, et longitudo eius tanta est quanta et latitudo et mensis est civitatem de harundine per stadia duodecim milia longitudo et latitudo et altitudo eius aequalia sunt*. 'The city lies foursquare, its length the same as its width; and he measured the city with his rod, fifteen hundred miles; its length and width and height are equal.'

¹⁰⁸ *Et aequale quidem est, quod ad aliquid comparatum neque minore summa infra est, neque maiore transgreditur, ut denarius denario vel ternarius ternario vel cubitioum cubito vel pes pedi et his similia*, Boetii, *De Institutione Arithmetica*, l. xxi, p. 45. 'Something is equal when that which is compared does not fall short by virtue of its smaller sum nor exceed by virtue of a larger sum, as a penny compared to a penny, or three compared to three, or a cubit compared to a cubit, or a foot compared to a foot, and other similar things.' Masi's translation is slightly different and does not include the reference to the penny, so I have provided my own translation in this case.

from the front (fig. 26). This is not to say that there is a direct relationship between the Saint Gall plan and Boethius' text. However, we can note that there is a similar architectural and representational language at play.

Subsequent diagrams in *De institutione arithmetica* lack any visual content which could be connected to contemporary architectural imagery. Book two is given over to the representation of numbers as linear, plane, and solid forms.¹⁰⁹ As a result, it is clear the subject is close to geometry, but Boethius is careful to point out that the 'shapes,' and 'forms' are generated from the number series about which he details their logical construction.¹¹⁰ Boethius makes little comment regarding the diagrams themselves, although he sometimes seeks to explain them.

De institutione arithmetica was the most important arithmetical work up to the twelfth century which contained explanatory figures, but the application of mathematics to a specific problem required a different approach. This practical application of mathematics was used to determine the dates of Easter over cycles of a particular number of years. The method of calculating the date of Easter was called *computus*, and the tables detailing the dates of the days of Easter over a period of years were called *computus* tables. To underline this division between theoretical examinations, such as those of Boethius, and applied mathematics, an introduction to the liberal arts from twelfth-century Coventry states: *Artifex ergo qui docet hanc artem dicitur arithmeticus, et qui secundum artem agit, computator*.¹¹¹ The division of practice

¹⁰⁹ Linear, plane, and solid forms relate to one-, two, and three-dimensional structures, underlining the idea that dimensionality was part of how at least some medieval readers interpreted their world.

¹¹⁰ Boethius states that, 'a plane surface is found in numbers', in reference to geometrical figures, Boethius, *Boethian Number Theory*, II. 6., p. 131.

¹¹¹ 'Therefore, the artist who teaches this art is called an *arithmeticus*, and he who acts according to the art a *computator*.' Charles Burnett, 'Innovations in the Classification of the Sciences in the Twelfth Century', in R. Työrinoja, A. Lehtinen (eds.), *Knowledge and the Sciences in Medieval Philosophy: Proceedings of the Eighth International Congress of Medieval Philosophy (S.I.E.P.M.), Helsinki, 24-29 August 1987* (3 vols., Helsinki, 1990), III, pp. 25-42, here p. 37.

and theory is inherent in each of the quadrivium arts we will examine. The separation of those who teach and those who solve problems reflects Faith Wallis' comment that the 'medicine and *computus* were essentially applied sciences,' which accompanied applications of the other quadrivial subjects.¹¹² The *computus* has been described as 'nothing more than a complicated mathematical problem,' which links it with Alcuin's text.¹¹³ I will outline the manner by which the calculation was successfully attained below; however, for now it should be noted that *computus* was essentially an applied art of medieval numerical theory. *Computus* tables and other tables connected with the proper dating of Easter are frequently placed within an architectural framing device. I will examine two English manuscripts which use an architectural frame for the Easter tables; its presence highlights the importance of architecture in quadrivial texts, and also illustrates how architectural representations were used to order the numbers.

Easter is a movable feast and is celebrated on the first Sunday after the first full moon that occurs on or after the vernal equinox.¹¹⁴ The presence of several versions of the *computus* with different dates for Easter undermined the desire to celebrate the Resurrection of Christ on the same day in all parts of Christendom, leading to intense divisions between different approaches.¹¹⁵ For example, Bede reports that one of the characteristic non-Roman practices carried out by some monasteries in Ireland concerned the day they celebrated Easter, which was different from that in both the south of England and the Roman church.¹¹⁶ Dionysius Exiguus (d. c. 544) established the most commonly used and orthodox calendar in 525, which

¹¹² Bede, *Reckoning*, p. xx.

¹¹³ Ibid., p. xviii

¹¹⁴ Alden A. Mosshammer, *The Easter Computus and the Origins of the Christian Era* (Oxford, 2008), p. 40.

¹¹⁵ Charles W. Jones, 'Two Easter Tables', *Speculum*, 13 (1938), pp. 204-205.

¹¹⁶ Bede, *Bede's Ecclesiastical History of the English People* edited by Bertram Colgrave and R.A.B. Mynors (Oxford, 1968), II. 4, p. 147. The Irish reckoning, according to Bede, relied on an eighty-four year cycle. More information regarding the Irish reckoning of Easter can be found in, David Howlett, 'Computus in Hiberno-Latin Literature', Dábhí Ó Crónín, Immo Warntjes (eds.), *Computus and its Cultural Context in the Latin West, AD 300-1200* (Turnout, 2010), pp. 259-323.

provided the dates of Easter for the following ninety-five years.¹¹⁷ Pope John I (d. 526) requested that Dionysius establish the dates, and in 525, in a letter to a bishop Petronius, and another written in the following year, Dionysius also detailed the manner in which the tables operated.¹¹⁸

Dionysius' Easter table uses eight separate columns, each of which contains a number. Working from left to right with the columns show: 1, the year since the Lord's Incarnation; 2 is the indictional year (this is a number from one to fifteen, which indicates the late Roman method of counting years); 3 the lunar epact (the age of the 'notional moon on the first day of the year'); 4 the concurrent (epact of the sun); 5 the number in the lunar cycle; 6 the day of the fourteenth (full) moon; 7 the day on which Easter falls; and 8 the Moon on Easter Day. The correct number inserted in each column is arrived at by purely mathematical processes which calculate the movement of the days and lunar cycles over particular cycles of time.¹¹⁹ The two most important columns are those for the lunar epacts, and the concurrent days of the week. The lunar epact is derived from taking the year, dividing this by 19, multiplying the remainder by 11, and then dividing this by 30.¹²⁰ The remainder from this calculation is the desired answer. One determines the concurrent day by dividing the current year by 4, adding the answer to the year, add 4, and then divide by seven. The remainder will be the day of the week on which the full moon falls.

In addition to this table there were others which provided more information for other variants over the course of a nineteen-year cycle, known as the metonic cycle.¹²¹ This included

¹¹⁷ The ninety-five year cycle is derived from five sets of nineteen year cycles. After ninety-five years, in most cases, the moon will be full on the same day and date as at the beginning of the cycle.

¹¹⁸ Dionysius Exiguus, '*Epistolae Duae De Ratione Paschae*', PL 67:19-28A

¹¹⁹ Little attention was paid to the actual positions and ages of the sun and moon at any given time, Richards, *Calendar*, p. 80.

¹²⁰ For a full explanation of how the *computus* works see: Mosshammer, *Computus* (2008), esp. chapters 5 and 6.

¹²¹ Richards, *Calendar*, p. 355.

presenting the correct number of days in the lunation (i.e., months of the year). Richards gives an example of this, where the number of the year in the metonic cycles is presented in the left column, followed by thirteen columns each presenting the correct number of days within each lunation.¹²² Whilst connected with the system to determine the date of Easter, such lunation tables were not strictly required to arrive at the correct date; however, they do provide more information to the reader who desires to know more about the underlying system involved in the *computus*. At times, these lunation tables, and those similar to them are presented in architectural frameworks.

Faith Wallis provides two examples of lunation tables presented in architectural frameworks, each of which are bound with other arithmetical and *computus* material. In this chapter, many of the examples used to clarify the link between architecture and the quadrivium come from two manuscripts, both in Oxford: St. John's College, MS 17 (MS **J**) ff. 42v-48v; and Oxford, Bodleian Library, MS Auct. F.1.9 (MS **A**). Both are English manuscripts containing an immense variety of mathematical texts; although they bear some resemblance to one another, they are most likely derived from different exemplars.¹²³ Wallis argues that **J** was written between 1102 and 1113, based on the years associated with the paschal tables and the dating clause within the manuscript.¹²⁴ She also argues the manuscript derives from the Benedictine abbey of Thorney as part of a 'programme of book production' at the abbey.¹²⁵ **A** was completed in the mid-twelfth century, and may derive from Worcester Priory, as indicated by a paste-down on f. i, which is similar to other manuscripts known to come from the abbey.¹²⁶

¹²² There are thirteen columns because seven years in the cycle contain an extra month of twenty-nine or thirty days, known as embolismic years, Richards, *Calendar*, p. 355.

¹²³ *Ibid.*, p. 86.

¹²⁴ Faith Wallis, 'MS Oxford St. John's College 17: A Mediaeval Manuscript in its Context' (unpublished PhD dissertation, University of Toronto, 1985), p. 129.

¹²⁵ *Ibid.*, p. 136.

¹²⁶ Richard William Hunt, Francis F. Madan, *A Summary Catalogue of Western Manuscripts in the Bodleian Library at Oxford* (7 vols., Oxford, 1953). II. 2., no. 4137, pp. 861-863.

Again, it is a compilation of mathematical texts with a similar content to the St. John's manuscript, but that 'contains an even more extensive tract of the abacus materials than does **J**, but [...] its character as a manuscript is very different.'¹²⁷ While the manuscripts may ultimately derive from different sources, 'it will be clear [...] they [the manuscripts] represent a much more considerable body of material now lost to us.'¹²⁸ In a sense, then, the manuscripts, and hence the illustrations associated with them, must be in some way representative of a wider body of material, especially if we acknowledge that the figures are an inherent part of the texts.

Paschal tables appear in a variety of contexts, but many became associated with the broader field of arithmetic. For example, **J** includes a *computus*, Bede's texts concerning the calculation of time, the letters of Dionysius, as well as other materials concerning the quadrivium.¹²⁹ **A** includes other mathematical material, such as instructions on mathematical game involving columns called *rithmomachia*, as well as discussion of the Paschal tables which provides examples of tables, some of which contain architectural details.¹³⁰ **A** also includes other arithmetical texts, including works on the abacus which will be discussed below. However, here it is important to simply note that tables and works for the computation of Easter are frequently associated with texts on arithmetic.

There are several examples of architectural tables used to present various aspects of the information required to calculate the dating of Easter which appear in both **A** and **J**. For instance, folios 28v and 29r of **J** contain two tables, both of which use ornamental architectural

¹²⁷ Wallis, 'MS Oxford', p. 466.

¹²⁸ Evans, 'Schools', p. 87.

¹²⁹ A summary of **J**'s contents may be found in Wallis, 'MS Oxford', pp. 26-31. Other material will be discussed below, p. 98.

¹³⁰ An explanation of the game may be found in, Menso Folkerts, "'Rithmomachia", a Mathematical Game from the Middle Ages', in *Essays on Early Medieval Mathematics: The Latin Tradition* (Ashgate, 2003), chap. XI, pp. 1-23.

forms to frame the information (figs. 27 and 28). The first 'table lists the lunar termini for Lent,' and also for Easter, Rogation days, Pentecost and Septuagesima.¹³¹ The architectural elements, such as the arches, columns, and bases are organised and the information is well-integrated into its features. The use of architectural elements for this particular table in eleventh- and twelfth-century England is reinforced by the repeated use in another manuscript from Winchester, Cambridge, Corpus Christi College, MS 422, Vol. II, p. 41 (fig. 29). While created for the same purpose the two are most likely not directly copied from one another because the order of columns differs; for example, the second column in **J** details the final moon for Easter, whereas the same information is found in the third column of the Cambridge manuscript. The text associated with both of these diagrams does not discuss the figures directly, and only gives general rules for determining the correct answers.

Another architectural drawing, albeit presented somewhat differently to the arcaded forms in **J**, appears in Paris, BnF, lat. 15170, f. 133v (fig. 30). This figure lists the calendrical days associated with lunation epacts during the metonic cycle.¹³² The table is presented as the entire south wall of a church, as indicated by the placement of the apse on the right side, and a cross at the end of the ridgeline on either side.¹³³ There are two interesting elements in the associated text. First, it appears to refer to the drawing as a *frontis*.¹³⁴ The use of this term will be discussed in detail below, but for now it is noted that it is also associated with Gospel

¹³¹http://digital.library.mcgill.ca/ms17/folio.php?p=28v&showitem=28v_5ComputusTablesTextsII_16TerminiMoeableFeasts

¹³² The metonic cycle is listed at the bottom, along with whether that year is common or embolismic; however, the first year of the cycle, on the far left, begins under the columns showing the days of the month, which makes it difficult to indicate the information about the first four years of the cycle. This casts doubt on the usefulness of the figure.

¹³³ It is possible the drawing presents the building from the front, as the figure is somewhat similar to the architectural imagery of contemporary seals, Cf. Carol F. Davidson, 'Images of Gothic Architecture: Structure or Symbolism', in Maurice Howard (ed.), *The Image of the Building: Papers from the Annual Symposium of the Society of Architectural Historians of Great Britain 1995* (London, 1996), pp. 5-16.

¹³⁴ *Sicque annuali littera [...] frontis inventuas*, Paris, BnF, MS lat. 15170, f. 133v.

canon tables, which are the most common form of architectural representation to appear in early medieval manuscripts.¹³⁵ Second, the author appears to acknowledge that there is no need to memorise the work.¹³⁶ This would imply that the architectural quality of the figure is not presented for the purposes of memory, as argued by Mary Carruthers in relation to Hugh's *De tribus*. Instead it would seem that the drawing's function lies in its ability to organise and structure information, in a similar manner to that described by Hugh of Saint Victor, discussed at the introduction to this chapter.

There are other types of diagram in **A** which contain specific information about lunar phases and concurrent days over certain periods of time, and which use the same two-dimensional language as Boethius to orientate the reader. The *computus*-related drawings appear on folios 12r-v (figs. 31 and 32). The drawing on f. 12r shows six columns with capitals, bases, and overlapping arches above. Its purpose is to indicate the concurrent day for the first four years of each metonic cycle in the great paschal cycle, which is made of up twenty-eight metonic cycles.¹³⁷ The passage relating to the structure of the diagram reads:

*Respice ad presente paginellam quae constat xxviii spaciolis in longum iiii autem in latum in qua concurrentium positione notati primi iiii anni singulorum decennovenalnius ciclorum per ordine qui sunt in toto magno paschali ciclo.*¹³⁸

Here, the use of *longitudo* and *latitudo* to describe the columns and rows of the figure is identical to that in found Boethius, and appears to be a common tool to help the reader understand the particular pieces of information in the figures.¹³⁹

¹³⁵ This will be discussed below, in the section which considers music.

¹³⁶ *Hoc tamen memor esto in non tot[as] lineas epistoli dionisii*, Paris, BnF, MS lat. 15170, f. 133v.

¹³⁷ Bede, *Time*, IV, 65., pp. 155-156.

¹³⁸ 'Looking at the present page which contains twenty-eight spaces in the length and four in the width, in which the concurrent [days] are placed, they note the first four years of each nineteen year cycle in the order in which they appear in the great paschal cycle.' Oxford, Bodleian Library, MS Auct. F. 1. 9. f. 12r.

¹³⁹ It is interesting to note that the author uses the term *spatio* to describe the individual squares of the figure, a term most often associated with geometry, and is discussed below in some detail, p. 190.

In contrast to this, Bede, who appears not to have included diagrams to accompany his texts, uses different vocabulary to describe the same tabular columns. For example, when describing the information contained in columns of the Paschal tables, Bede uses the term *ordo*, which make sense within the context of a table but is at odds with the two-dimensional diagrams discussed above, which use the terms *latitudine* and *longitudine* to describe the same thing.¹⁴⁰ Hence, within medieval England there would seem to be different links between the texts used to describe accompanying diagrams: one, in the case of Bede, uses the architecturally neutral term *ordo*, while another uses a two-dimensional structure which associates diagrams and figures with architectural elements.

In his commentary on the arithmetic section of Martianus' *Marriage of Mercury and Philology*, William Stahl focuses on the similarities and differences between geometry and arithmetic. One of these is that arithmetic concerns the abstract and not the physical properties of the world.¹⁴¹ Stahl notes that 'numbers are incorporeal, unless they are applied to objects.'¹⁴² Boethius' provision of diagrams demonstrates the underlying relationship between numbers and epistemic images, and highlights the importance of a multi-lateral approach to teaching in the Middle Ages, one which includes and values visual cues. Echoing this purpose, the mathematical nature of the tables has been described as taking the viewer from visible to invisible forms, and one way this movement is mediated is by architectural drawing.¹⁴³ The drawings under discussion are two-dimensional both in their form and the language used to describe them. For example, the Easter lunation tables present orthographic

¹⁴⁰ Bede, *Time*, IV. 48., p. 130.

¹⁴¹ 'Numbers are apprehended by the intellect, lines by sight. Numbers belong to Arithmetic; linear figures, the province of Geometry [...]. Lines are begotten of incorporealities and are fashioned into manifold perceptible shapes [...].' Martianus, *Martianus Capella*, Vol. I, p. 149.

¹⁴² Ibid.

¹⁴³ Burnett, 'Innovations', p. 37

views of arcades, or sometimes entire churches, to act as a grid and to organise the material.¹⁴⁴ Boethius and, as is discussed below, other medieval authors also orientate the reader around the drawings by means of width and length, reinforcing their two-dimensional structure. I am not arguing that the terms *latitudo* and *longitudo* are exclusively architectural terms, only that the use of width and length to orientate the reader around a diagram makes the diagram inherently two-dimensional. Furthermore, the use of these terms can be linked with contemporary architectural terminology, as appears in Scripture and other arithmetical treatises, such as Alcuin's *Propositiones*. In at least one example, it can be shown that architectural frameworks reflect the use of this two-dimensional terminology, whereas simple grid-like patterns do not use the same orientating structure to describe the diagrams. This two-dimensional framework echoes Hugh of Saint Victor's description of his indexing grid for learning the psalms, using the language of length and width to navigate through the grid.

¹⁴⁴ Orthographic representation of architecture was discussed on pp. 33-34.

Geometry

Geometry is the only subject of the *quadrivium* in which the explicit connection with architecture is well attested during the later Middle Ages, and remains consistent into the modern period. This connection is not apparent in early medieval texts, only coming into focus during the course of the twelfth century. In this discussion of geometry I will pinpoint the point at which architecture and geometry became demonstrably linked. Lack of clarity concerning the intellectual link between architecture and geometry stems from the tendency of previous modern scholarship to focus on texts solely concerned with geometry, without considering the applications to which the subject was put. For example, we shall see that geometry is frequently invoked by medieval authors when describing the function of the abacus, and other arithmetical processes. Many such texts are accompanied by representations of architecture, offering a tantalising, albeit indirect, indication of architecture's association with geometry during the twelfth century. By drawing on the evidence provided by texts on the abacus it will become clear that medieval authors made links between architecture and geometry before they become explicitly clear at the end of the twelfth century. To consider these questions, I will first examine texts which claim geometry influences their subject matter and simultaneously use an architectural framework to convey information. Then, I will discuss why architecture was a suitable vessel in which to place information which the text claims is defined, in some sense, by geometry. This will also demonstrate why the tables which appear throughout this chapter are defined by length and width, that is, by two dimensions only, in a similar manner to those discussed in the previous

section. This section will not discuss the possible uses of geometry in the construction processes of the Middle Ages.¹⁴⁵

Until the beginning of the twelfth century one important source for geometrical texts was derived from Roman *Agrimensores*.¹⁴⁶ This term encompasses several late-Roman texts on surveying which demonstrate the practical application of geometrical ideas and equipment for the purpose of measuring fields, and other pieces of land.¹⁴⁷ The *Agrimensores* helped to define the primary concerns of geometrical texts from the early Middle Ages, the most influential of which are the Pseudo-Boethian *Geometry I* and *Geometry II*.¹⁴⁸ There are hints that the authors of these two geometrical texts were aware that knowledge of geometry could potentially be an advantage to the medieval mason. For example, the author of *Geometry I*, begins by outlining the usefulness of the subject, writing, *Utilitas geometriae triplex est, ad facultatem, ad sanitatem, ad animam. Ad facultatem, ut mechanici et architecti*.¹⁴⁹ This, however, is followed by instruction on land-surveying which remains only minimally useful to a potential builder. The Pseudo-Boethian *Geometry II* contains an incomplete translation of Euclid's treatise on geometry. Architecture is not mentioned, and the content is concerned with definitions and abstract figures, and little to do with the practicalities of building.¹⁵⁰ The

¹⁴⁵ One recent work devoted to the relationship between geometry and medieval architecture is Robert Odell Bork, *The Geometry of Creation: Architecture Drawing and the Dynamics of Gothic Design* (Farnham, 2011).

¹⁴⁶ Stephen K. Victor, *Practical Geometry in the High Middle Ages* (Philadelphia, 1979), p. 5.

¹⁴⁷ Zaitsev, 'Meaning' p. 524. Cf. *Corpus Agrimensorum Romanorum*, edited by Carl Thulin (Leipzig, 1913).

¹⁴⁸ Zaitsev, 'Meaning', pp. 524-55.

¹⁴⁹ 'There are three uses of geometry, for practical skill, for health, and for the soul. Regarding the skill, it is for workers, and architects.' What the term *architectus* actually defines is difficult to exactly describe. It may be that the author has in mind Vitruvius and the relatively wide concerns he details in *De architectura*. For a discussion on this subject see: Pevsner, 'The Term 'Architect'', pp. 549-562. The term *mechanici* is also problematic. Isidore refers to the *machina* which he describes as the scaffolding on which the masons stand, 'due to the height of the walls.' See: Isidore of Seville, *The Etymologies of Isidore of Seville*, trans. Stephen A. Barney *et al.* (Cambridge, 2006), XIX. vii., p. 377. Boethius may also have machines of some sort in mind as well. However, if this were the case, machines were of concern to the architect from antiquity. See: Vitruvius, *De Architectura*, p. 341.

¹⁵⁰ There are hints in *Geometry II* that there was some confusion over the names of some of the shapes, at least one of which became associated with a building type. For example, in the chapter on the names of stone boundary shapes, one reads as *Sepulturam cum ossibus finale. Mauspleus*. However, in the eleventh-century

text is important because it constitutes some of the only known parts of Euclid's important treatise *Elements*, which would remain largely unknown until the middle of the twelfth century.¹⁵¹ As stated above, this section is not concerned with building practice, but it is important to highlight the development of architectural drawings alongside geometry during the twelfth century in the context of both the building site, and as a subject which appears in monastic texts.

It is only during the twelfth century that geometry begins to be explicitly associated with the process of construction.¹⁵² Abbot Suger's (d. 1151) description of the renovation of the abbey church of St. Denis in 1140 does not discuss the building process in detail, however he writes, 'the central nave of the old nave should be equalized, by means of geometrical and arithmetical instruments.'¹⁵³ The implication here is that while laying out the plan of the building, the architects used a set of geometric processes and tools to determine the shape of the church.¹⁵⁴ Contemporary with Suger's building work, Hugh of Saint Victor (d. 1141) wrote *De practica geometrie*, this set out rules for the construction of figures and measuring objects.¹⁵⁵ In this text Hugh makes a point of highlighting and defining the difference between theoretical approaches and practical applications of geometry. He states, 'practical geometry uses instruments, and gets its results by working proportionally from one figure to another.'¹⁵⁶

manuscript (St. Gall, Cod. 830, f. 239r) the final word becomes *mausoleus*. A diagram which is tower-shaped cuts the word between the 'u' and the 's', and the diagram bears some similarity with a tower shape which is associated with Roman mausoleums.

¹⁵¹ Marshall Clagett, 'King Alfred and the Elements of Euclid', *Isis*, 45 (1954), pp. 269-277.

¹⁵² There are, however, images of God holding a pair of compasses as the divine geometer, such as in the Eadwine Psalter. The iconographical relationship between this image-type, and geometry as a subject of the quadrivium is problematic. C.f. Zaitsev, 'Meaning', pp. 540-44.

¹⁵³ Abbot Suger, *Abbey Church*, p. 101. Abbot Suger's renovation of the abbey church of Saint Denis has been linked with the genesis of the new Gothic style which emerged during the twelfth century.

¹⁵⁴ This would seem to be supported by the plan of the building itself. Hugh of St. Victor, *Practical Geometry*, trans. Frederick A. Homann (Milwaukee, 1991), p. 18, attempts to explain why geometry may have been needed to build on this awkward site.

¹⁵⁵ Ibid.

¹⁵⁶ Ibid., pp. 33-34.

The text contains almost nothing to do with architecture however, and may only be useful for measuring the heights of a building (or any object), but not for the construction of a building. The similarity between Hugh's description of practical geometry and Suger's passing mention that the geometrical placement of the church's east end used instruments has drawn some scholars to make a direct connection between the two.¹⁵⁷

The next most important original treatise on practical geometry was completed at the very beginning of the thirteenth century by Leonardo of Pisa (d. c. 1250).¹⁵⁸ The texts of Fibonacci, as Leonardo was known, represent important developments in mathematics, but again, do not consider the role of geometry in relation to architecture. At approximately the same time Fibonacci was writing his *Practica geometria*, there are hints that architecture's link with geometry was becoming more explicit, a state of affairs which coincides with the growing recognition of architects as a professional class.¹⁵⁹ Abbot Suger's remark hints at the use of instruments to demarcate shapes during the building process at the beginning of the gothic period. The monument to the architect of St. Nicaise, Reims, Hugh Libergier (d. 1263) displays a geometrical instrument, in this case a pair of compasses, as a method of representing Hugh's vocation. This sort of association between figure and instruments for the purpose of demonstrating the status and role of the architect only becomes consistent during the thirteenth century.¹⁶⁰ Whatever Villard de Honnecourt's (d. c. 1230) actual profession was, his architectural portfolio asserts an interest in geometry for the construction of shapes which may have been useful for an architect.¹⁶¹ Also, it would appear that architects from the late-

¹⁵⁷ Conrad Rudolph, *First, I find the Center Point: Reading the Text of Hugh of Saint Victor's The Mystic Ark* (Philadelphia, 2004), p. 17.

¹⁵⁸ Leonardo Fibonacci, *Fibonacci's Liber Abaci: Leonardo of Pisano's Book of Calculation*, trans. L.E. Sigler (New York, 2003), p. 3.

¹⁵⁹ Lon R. Shelby, 'The Geometrical Knowledge of Mediaeval Master Masons', *Speculum*, 47 (1972), pp. 395-421.

¹⁶⁰ Wilson, *The Gothic Cathedral*, pp. 142-3.

¹⁶¹ Barnes, Jr., *The Portfolio*, p. 24.

twelfth century and consistently afterwards would draw out required shapes using precise tools and instruments, which would conform to Hugh of St. Victor's definition of practical geometry.¹⁶² Later, Euclid, as the creator of many geometrical rules, became a figure-head, representing masons as an entire class of workers.¹⁶³ From this brief survey, it would seem that by the late twelfth century geometry is already associated with the architect at the point at which the profession becomes recognisable.

In order to gain a full understanding of architecture's growing relationship with geometry during the course of the twelfth century it is necessary to broaden the types of sources under review. As illustrated above, there is little of explicitly architectural interest in the geometrical texts from before the thirteenth century; as is also clear, there are no building treatises from the medieval period which discuss the subject in any detail.¹⁶⁴ However, one of the surprising uses to which geometry was put was in the creation and use of the abacus as a mathematical tool. The abacus consisted of a schematic table drawn on a flat surface with up to twenty-seven individual columns. Each column represented units, one, ten, hundred, and progressing in multiples of ten. Counters were then placed in these individual columns. Originally the number of counters within a column constituted the desired number, for example, two counters in the hundred column and three in the single unit column would result in the number 203. From the eleventh century, and increasingly into the twelfth, the modern Arabic-Hindu number notation system was introduced. This meant that counters with modern-style numbers on them, such as two or four, could represent larger amounts using less material. For example, placing a counter with number four in the hundred column, would

¹⁶² Pacey, *Medieval Architectural Drawing*, p. 42.

¹⁶³ Anthony Gerbino, Stephen Johnston (eds.), *Compass and Rule: Architecture as Mathematical Practice in England, 1500-1750* (Oxford, 2009), p. 18.

¹⁶⁴ Bucher, *Architector*, p. iii.

give the number 400. This added much more flexibility and efficiency into the system.¹⁶⁵ In many texts with accompanying examples of the abacus table, that table is shown with architectural elements and details.

The first Western text concerning the abacus was written by Gerbert of Aurillac (later Pope Sylvester II). The text, *Regulae de numerorum abaci rationibus*, was written between 972 and 982.¹⁶⁶ As will be seen, the text became important for later writers on the abacus, who used Gerbert's text as a commentary source for other texts. This earliest text links geometry with the practice of the abacus; Gerbert writes: *Habes ergo, talium diligens investigator, viam rationis, brevem quidem verbis, sed prolixam sententiis, et ad collectionem, intervallorum et distributionem in actualibus geometrici radii [...]*.¹⁶⁷ The *intervallum* here refers to the individual columns which make up the abacus. Gerbert has taken the technique of drawing the columns and the spaces between them from the act of drawing associated with geometry, most probably to ensure that each column is regularly spaced. This introductory passage then proceeds to a description of multiplication and division. During the eleventh and twelfth centuries a number of other treatises on the abacus were created, some of which were clearly used for the education of students.¹⁶⁸ Bubnov, in his study of Gerbert's mathematical works, includes many of these additional texts in an appendix, showing that a large number of them make reference to Gerbert's original work.¹⁶⁹ In addition to Gerbert's text Gillian Evans has highlighted the importance of Ralph of Laon's eleventh-century *Liber de abaco* and its

¹⁶⁵ The advantage offered by the Hindu-Arabic are outlined in J.M. Pullan, *The History of the Abacus* (London, 1968), p. 32.

¹⁶⁶ Nicolaus Bubnov (ed.), *Gerberti, postea Silvestri II papae, Opera Mathematica* (Berolini, 1899), p. 7. The 1963 republication of this book, published in Hildesheim, does not update or change the edited material.

¹⁶⁷ *Ibid.*, pp. 7-8. 'Therefore you have the careful investigator of such things, a road of rational thought, a certain brief thing in words, but extensive in wisdom, and for the collection of columns and the distribution of things, in the doing of the branch of geometry.'

¹⁶⁸ Bubnov, *Gerberti*, pp. 245-269.

¹⁶⁹ Bubnov includes many mathematical works from the eleventh and twelfth centuries, many of which mention Gerbert in some respect. C.f. *Ibid.*, pp. 155, 197, 245.

influence on English versions of the abacus in particular.¹⁷⁰ It is these English versions which we will focus on for the sake of providing case studies of architectural representations in abacus texts.

One manuscript which includes abacus texts is the St. John's College, MS J we have already described in relation to arithmetic. Faith Wallis has described J as a 'centripetal manuscript; that is, a core of computus texts and tables around which gathered a halo of analogous materials.'¹⁷¹ The manuscript is tied to the arithmetical concerns of the quadrivium, which the compiler has divided into discrete subjects, such as the computus, abacus, and texts on astronomy. As already indicated, one of the distinguishing features of the manuscript is the large number of architectural frameworks used to present information. For example, ff. 41v-42r contain an immense amount of arcading which frames the process of multiplication and division on the abacus (figs. 33 and 34). The arcade on f. 42r is consistent in its design: there are three encompassing arches drawn with a green band, three circles in the tympanum space of each arch, and three smaller arches coloured in blue enclosed within the larger arches. Underneath, the three columns are divided into a smaller arcade band, each of which contain *intervallia*, or columns, for the units, tens, and hundreds columns. This same structure is repeated on ff. 48v-49r, where the bottom third of the opening is devoted to the abacus (figs. 35 and 36).¹⁷² It is clear that the artist who carried out the work on the abacus in J associated the subject with architectural representations, and such representations were not considered inimical towards communicating the subject.

¹⁷⁰ Gillian R. Evans, 'Schools and Scholars', p. 71. Ralph of Laon's work, which appears in Oxford, Bodleian Library, MS Hatton 108, does not include any figures.

¹⁷¹ Wallis, *Oxford*, p. 466. Wallis has published many of her findings on this manuscript online (<http://digital.library.mcgill.ca/ms-17/>). [Accessed 11/09/13].

¹⁷² Gillian Evans has pointed out that this particular example corresponds to the structure described by Ralph of Laon in his *Liber de abaco*: Evans, 'Schools', p. 80

The architectural elements in ff. 41v-42r help the reader interpret the operations which the diagrams seek to illustrate. The architectural representations provide a clear layout to determine the relationship between the different parts of the diagram. For example, the encompassing arches, which are coloured green, divide the numbers into sections for the sake of clarity. On f. 42r, moving from right to left the columns move upwards in value, from a single column to tens, to hundreds. These three columns are encased in a green column. The effect is similar to modern usage where a large number is separated by commas every three numerals.¹⁷³ This structural clarity is reinforced by the added information included at the bottom; here we see other forms of the same information placed underneath alternating coloured arches. For example, the column on the right states that it represents the quantity *unus*, or 'one,' the second, to the left of the first, indicates it holds the quantity *decem* or 'ten.' This sequence continues in multiples of ten as the columns move left. Underneath these terms the artist has placed the numbers in the form of Roman numerals. We see in this example that the structural qualities of the architecture help the reader to understand and read the information in a highly logical fashion.

Wallis' other manuscript, **A** (Oxford, Bodleian Library, MS Auct. F. 1. 9.) contains fewer architectural representations, but still includes them in particular sections, especially those which provide instruction for multiplication, division, and the use of fractions, examining how to use the abacus for these functions. Ff. 27r-41r contain an anonymous Latin treatise on fractions and divisions which begins: *Cognitis unciarum minutiarumque nominibus* (fig. 37). Above this incipit, on f. 27r, there is a large set of arcading with seven individual columns. The first column, on the left, contains signs which denote a particular fraction. Many of the twelfth-

¹⁷³ For example, the number for a million can be written as 1,000,000.

century fractional processes were figured through a denominator of twelve (*uncia*), where the fraction is given an individual symbol. For example, the seventh symbol down on the left side, with the associated description of *semis*, is equivalent to 6/12. This table is well laid out, with the architectural details integrating well with the information. However, it is clear that the numerical information in the intercolumnar space was drawn before drawing the architecture. The second column holds the initial of the word placed to its right; however the column does not meet the capital at the top properly. This may indicate that the red box, which forms part of the column, was present before the rest of the architectural detail was added. This sequence is confirmed by the bottom part of the same column. Here half the column base is missing, again indicating that the word *alcus* was previously present, and that the artist was forced to draw the architecture around it.

The visual relationship between the abacus and architecture would seem clear; it is underlined by a passage in MS **A**, which makes the parallel textual relationship explicit. Ff. 66v-72r contain a small text on the abacus (edited in Bubnov's appendix), the title of which is given as *Incipit prefatio libri abaci. Que[m] iunior Bernhelm[us] edidit parisius domino suo amylio. Bernelmus suu[s] eterne felitatis munys*.¹⁷⁴ It is not clear who exactly Bernelmus is. Bubnov notes the existence of a 'Bernelinus,' but fails to offer any information on him, other than that he could not have written before 999.¹⁷⁵ It would seem that, if MS **A** is taken at face value, and that the Bernelmus mentioned in it is the same as Bubnov's Bernelinus, it is possible that the latter wrote his text in Paris. Bernelmus' text takes some elements from the *Commentarii in Gerberti regulas de numerorum abaci rationibus*.¹⁷⁶ For example, Bubnov's

¹⁷⁴ 'The preface of the book of the abacus begins. That which the young Bernhelmus published for his Parisian master with love. His Bernelmus sends eternal blessings.' **A**, f. 66ra.

¹⁷⁵ Bubnov, *Gerberti*, p. 383.

¹⁷⁶ *Ibid.*, p. 245.

edition of the first commentary reads: *qui instar calami, in Ezechiele templum mensurantis, ad votum geometricorum in coeli terraque dimensione modo inclinatur modo erigitur [...]*.¹⁷⁷

Bernelmus' commentary in **A** is broken into sections which do not appear in Bubnov's edition, one of which is entitled *De radio geometrico*.¹⁷⁸ Bernelmus includes this mention of Ezekiel's Temple completely, with only slight changes.¹⁷⁹ The text also appears in **J** on f. 42v, but this section is almost identical to Bubnov's edition.¹⁸⁰ Bernelmus takes Gerbert's statement about the importance of geometry for the abacus, and ties it explicitly with the most extensive description of architecture in Scripture, Ezekiel 40-48.¹⁸¹ It would seem that two exemplars (for both **J** and **A**) may have included a reference to Ezekiel's meticulous measurement of the Temple complex, as described in Scripture. This would imply that perhaps two authors, including Bernelmus of Paris, likened the use of geometry in the creation of the abacus table with architecture.

Just as in the other subjects of the quadrivium, the vocabulary associated with geometry becomes architecturally focused, although it is unclear whether this is as a result of the inclusion of architectural representations or a symptom of the same. The most direct example is the use of the term *arcus* (arch) to describe the individual columns in which the counters of the abacus are placed.¹⁸² The manner in which this term changes use demonstrates

¹⁷⁷ Bubnov, *Gerberti*, p. 250. 'in which the image of the measuring rod for the Temple of Ezechiel, the heaven and earth is inclined and erected according to the dimensions of geometry.'

¹⁷⁸ Bubnov would seem to have been aware of **A** because he includes readings from it, e.g., p. 560.

¹⁷⁹ Auct. F. 1. 9. f. 66v.

¹⁸⁰ Bubnov, *Gerberti*, p. 245.

¹⁸¹ Ezechiel's extensive architectural description will be discussed in detail in chapter two.

¹⁸² Charles Burnett, '*Algorismi vel helcep decentior est diligenia*: the arithmetic of Adelard of Bath and his circle', in M. Folkerts (ed.), *Mathematische Probleme im Mittelalter: Der lateinische und arabische Sprachbereich* (Wiesbaden, 1996), pp. 221-331, here p. 228. In an architectural context the same term has been used to describe the stone arches built in a church, *Hujus patris [Frogerii de Sancto Loancio, abbatis] tempore, claustrum monachorum novo et eleganti opere est constructum, et arcus lapideus qui inter capitulum et dormitorium est erectus*, Mortet, *Recueil*, p. 89. 'Concerning this abbot's time, the new monk's cloister was made, having been elegantly constructed; and the stone arch [*arcus*] between the capitals of the dormatory was erected.'

that some terminology is prone to change, and shows the reference to architecture when it came to the organisation of knowledge and its language. This architectural vocabulary has never been examined in detail. *Arcus* as a term is used as a matter of course by Bubnov when describing the individual columns of the abacus table.¹⁸³ However, *arcus* does not appear in Gerbert's original text, where he prefers to use the non-representative terms *intervallis* or *terminis* to describe the individual compartments of the abacus.¹⁸⁴ This use of *arcus* appears for the first time at the end of the eleventh or beginning of the twelfth century in Leiden, University Library, Voss MS 8. N 95, ff. 11r-12v, which describes Gerbert's rules for division.¹⁸⁵ *Arcus* then becomes associated with Gerbert's text during the eleventh century, in the Leiden text, where it becomes a recognisable reference to the abacus table. While Gerbert does not use the term, arches do appear in the earliest examples of his abacus, and in many subsequent examples, as discussed below. For example, Paris, BnF, MS lat. 8663, f. 49v is an example of a tenth-century abacus directly connected with Gerbert's own writings (fig. 38). The use of arches to distinguish the different columns gives an architectural quality to the abacus which is not present in every example.¹⁸⁶ This early example of the arched abacus table is identical in structure to the later example in **J**, whose table is constructed in sets of three columns. Despite this lack of consistent depiction of architectural details from the earliest stages of the abacus, it would seem the text developed alongside an architectural idea or assumption that there would be arches within the abacus, and not simply spaces called *intervallia*.

Bubnov gives twenty-one manuscripts which contain Gerbert's treatise on the abacus, many of which contain drawings elaborating on the appearance of the *tabula*. Eight out of

¹⁸³ e.g., *Ibid.*, pp. 37, 45.

¹⁸⁴ *Ibid.*, p. 7. By non-representational I mean it does not attempt to describe the appearance of an object in the physical world.

¹⁸⁵ *Ibid.*, p. 292.

¹⁸⁶ Another tenth- or eleventh-century example lacks arches: Paris, BnF, MS lat. 6620, f. 59r-v.

the twenty-one manuscripts are post-medieval, and were not consulted for this study. One other, Chartres, Bibliothèque Municipale, MS 41 was destroyed in 1944. Of the remaining twelve manuscripts I have been able to consult eleven in order to determine how many, if any, contain architectural details of some sort.¹⁸⁷ Of these eleven, six use arches to group the columns, a detail essentially unrequired in order to use the table, but one that gives the table an architectural appearance. Some, such as Vatican City, Biblioteca Apostolica Vaticana, MS Reg. lat. 3123 contain only arches, with decorations sometimes added, for example on ff. 43r and 73v. Others use architecture much more frequently and include many more elaborate details, such as found in Leiden, Universiteitsbibliotheek, MS Scaliger 38, which begins with an outline of different types of Latin numbers set in architectural tables. Running across the top of each column it reads '*Unus, primus, singuli, semel, simplum*.'¹⁸⁸ More arches appear later in the manuscript, providing the framework for a set of computus tables (f. 16v), a selection of multiplication tables (ff. 30v-31r), and an architectural abacus used for division (f. 59r). This latter manuscript is reminiscent of Wallis' 'centripetal' manuscripts, where arithmetical works are loosely bound around a set of computus materials. It would appear from this survey of Gerbert's manuscripts that architecture played a relatively important role in the transmission of Gerbert's work, but not in all cases.

A change to the vocabulary of the abacus can be set against the backdrop of a wider development within the field of geometry. Zaitsev has highlighted the changing definition of geometrical terminology from the ninth to the eleventh century, which may have some part to play in the use of architectural imagery in later manuscripts.¹⁸⁹ In the ninth-century treatise

¹⁸⁷ I have not consulted Brussels, Bibliothèque Albert Ier., MS 10095. Thanks are due to Claudio Giammona for his help in providing manuscript descriptions of, Vatican City, Biblioteca Apostolica Vaticana, MSS Reg. lat. 1071, and 1405.

¹⁸⁸ f. 2r

¹⁸⁹ Zaitsev, 'Meaning', pp. 522-553.

known as *Geometria I* the term *fundus* retains its gromatic meaning of 'real estate;' however, in the later *Geometrica ars anonymi* the term's meaning has shifted slightly to mean 'foundation': 'we should first fix *fundus*, on which the totality of measures will be settled. *Fundus* is used because everything is laid down and made stable upon it.'¹⁹⁰ Here, *fundus*, as a purely gromatic and legal concept, has become a philosophical principle of rational thought in relation to geometrical texts. To this way of thinking, the *fundus*, as foundation, must be first established in order to come to a proper understanding of a subject such as geometry. Zaitsev describes this development of the term as 'reminiscent of certain biblical passages,' such as Psalm 103:5, 'Who laid the foundation of the earth.' This is a minor point, but it does illustrate that while there are no explicit descriptions of architecture in geometrical treatises, the concepts of architecture, such as the foundation, were not considered alien to the subject of geometry. Indeed the development of architectural vocabulary, such as *fundus*, in the context of learning supports the wider point of this chapter; that such words helped to communicate the abstract qualities of education.

The question remains as to why architecture was chosen as the visual medium of choice. By visual medium I mean a figure which attempts to frame and convey a particular set of information, in this case the counters used in the abacus. This framework clearly had a real world equivalent, the process Gerbert describes where chalk dust was laid out on a table, and the *arci* or *intervallia* were drawn in place. Before we can examine why medieval authors on geometry felt the need to explain the presence of such figures we must first articulate the contemporary definition of a *figura* and *tabula*, the latter becoming the normative term for the abacus table.

¹⁹⁰ Ibid.

A 'figure' in a modern book is an image associated with a piece of text which helps the reader to understand particular elements of a subject.¹⁹¹ There are a number of scholarly discussions on the topic of *figura*. For example, Karen Faye Webb discusses the use of architectural images in the thirteenth-century manuscripts at Chartres.¹⁹² Webb's discussion, however, focuses on the philosophical and Aristotelian foundations of the *figura* and does not reference any medieval definitions of the term. According to Webb, from late antiquity onwards, the definitions of a figure are split into two types, formal and functional definitions, both of which concern the appearance of architecture in texts. Augustine's text *De quantitate animae* contains a short discussion between the master and his student on the subject of geometry, as well as various definitions associated with it.¹⁹³ This section of text considers and rejects the possible three-dimensional existence of the soul, concluding that it is, instead, a much greater entity than may be contained within boundaries. Augustine has the master defining a *figura* as, 'any demarcated space which is contained by lines.'¹⁹⁴ This space does not have to be contained within two dimensions, but the examples provided in Gerbert's geometric text, described below, only use length and width. This definition is echoed in one of the most popular geometrical texts from the Middle Ages, Gerbert's *Isagoge Geometria*. Here Gerbert states that 'a figure [*figura*] is a space enclosed by boundaries,' and he directly references Augustine's text.¹⁹⁵ Thus it would seem that, within the field of geometry a *figura* has a relatively well-known definition: it is space or an area with lines around it.

¹⁹¹ 'A delineation illustrating the text of a book; a diagram, an illustration.' Oxford English Dictionary Online, <http://www.oed.com/view/Entry/70079?rskey=i8OrXz&result=1#eid>. [Accessed: 18/08/14]

¹⁹² Karen Faye Webb, 'Medieval Manuscript Diagrams, Architectural Structure, and their Relationships: The Case of Chartres Cathedral' (unpublished PhD. Dissertation, University of Pittsburgh, 2010), pp. 15-17.

¹⁹³ PL 32: 1033-1080, here cols. 1041-1049.

¹⁹⁴ *Figuram interim voco, cum aliquod spatium linea lineisve concluditur*, PL 32: 1041.

¹⁹⁵ Bubnov, *Gerberti*, p. 55. See also, Gillian R. Evans, 'The 'Sub-Euclidean' Geometry of the Earlier Middle Ages, up to the Mid-Twelfth Century', *Archive for the History of the Exact Science*, 16 (1976/7), pp. 105-118, here p. 111.

Both Augustine's and Gerbert's formal definitions of *figura*, based on its simple appearance on the page, could also form a definition of architectural drawing. Both conceive of a space which is defined and enclosed by a line.¹⁹⁶ Indeed this definition, for all intents and purposes, describes architecture better than it does the figures associated with Augustine's and Gerbert's texts, which are not always enclosed. Much of Gerbert's imagery is, necessarily, abstract, comprising parallel lines, and other geometrical shapes, examples of which Bubnov includes at the end of his edition. However, it is worth noting that the figures were interpreted as whole entities, and not as separate schematic lines. The medieval *figura* is an object which contains space; it is not simply an assortment of straight lines arranged to form a diagram of some sort. Architecture fits very well into this definition of *figura*, and there is nothing to suggest that some sort of representative image – such as a building – could not be considered as a *figura*.

The second type of medieval definition for *figura* is related to its pedagogical function, a function which became increasingly important through the twelfth century. Sicard argues that from the twelfth century diagrams acted as replacements for the presence of the teacher.¹⁹⁷ Sicard's main point is in relation to Victorine texts, and their tendency to concentrate on literal readings alongside explanatory images. The movement from a charismatic teacher, present while the student learns, to a text-based curriculum is one made by Stephen Jaeger's who has argued that the twelfth century was a transitional point in educational development in just this manner.¹⁹⁸ The abacus is a good example of this point,

¹⁹⁶ For both of these authors a line is defined as an entity with two points and length, but not width or height; it is a two-dimensional geometrical figure.

¹⁹⁷ Cf. Sicard, *Digrammes*, p. 101. fn. 18.

¹⁹⁸ Jaeger, *The Envy of Angels*, p. 241. Jaeger outlines a transition from a charismatic style of teaching associated with a particular teacher, into a more textual based experience, a transition which takes place at the beginning of the twelfth century. For an indication of how such changes impacted scribal culture see: M.B. Parkes, 'The Influence of the Concepts of 'Ordinatio' and 'Compilatio' on the Development of the Book', in M.B. Parkes (ed.),

since its technical nature means that the presence of an expert while learning the subject would have been particularly helpful. Faith Wallis argues that Gerbert's *Ratio regularum abaci* was probably meant as a supplement to classroom teaching, because the *Commentari* on Gerbert's abacus text observes that one may 'demonstrate the abacus much more easily than one can describe it in words.'¹⁹⁹ The figure's presence is a pedagogical tool which allowed for a shorter, clearer explanation of a subject when a master was not present.

This functional-type of definition of *figura* is better attested than the formal definition above, and remains relatively consistent in texts up to the sixteenth and seventeenth centuries. The presence of figures within a text coincides with the text's pedagogical function; ultimately the purpose of a figure is to instruct the reader on a subject such as geometry. The figures assist by allowing the reader an alternative medium through which to understand the instruction. Augustine also highlights that some people learn better by seeing rather than solely by reading.²⁰⁰ In the *Commentarius* discussed above, the figures are provided as a way of explaining the functions of some aspects of the abacus to the student. The pedagogical function of the *figura* continues in texts on geometry, and by extension on the abacus too. Aelred of Rievaulx (d. 1167), abbot of the Cistercian monastery at Rievaulx, discusses the imperceptibility of the soul, in a text largely reminiscent of Augustine's *De quantitate animae*, and Gerbert's *Isagoge*. Aelred asks John 'through what of these things did you learn, the word, the body, or through the image?'²⁰¹ John responds, 'on the contrary [I learned] many things through every method.'²⁰² Here Aelred implicitly acknowledges three methods of learning,

Scribes, Scripts and Readers: Studies in the Communication, Presentation and Dissemination of Medieval Texts (London, 1991), pp. 35-70.

¹⁹⁹ <http://digital.library.mcgill.ca/ms-17/>. [Accessed 12/08/14]

²⁰⁰ Augustine, *Teaching*, p. 33.

²⁰¹ 'Verba vel corpuscula, vel imagines per quas eas didicisti?' Ailredi Rievallensis, 'De anima', in A. Hoste, C.H. Talbot (eds.), *Ailredi Rievallensis*, CCCM 1 (Turnhout, 1971), II. 10., p. 709.

²⁰² *Ioannes: Immo multum per omnem modum*. Ibid., p. 710.

especially for subjects which are inherently intangible such as arithmetic, and in this case, geometry.

Having established the importance of *figura* as a teaching tool, the question still remains as to why architecture in particular was chosen as a popular medium for depiction of many abaci. Aelred's three modes of teaching included one described as *per corpuscula*, or 'through the body.' Aelred later acknowledges that it is easier to learn to calculate by manipulating the actual counters on an abacus, 'handling them with one's own hands and moving them about.'²⁰³ This tangible mode of learning may be compared to that described by Hugh of Saint Victor, in his *Didascalicon*: 'I learned by walking both figures and measuring them with my feet.' Aelred's, *per corpuscula*, then, concerns a kinaesthetic style of learning, one which presents the student with the opportunity to relate a subject to a physical object, something they may touch.²⁰⁴ However, in terms of geometry, and hence when drawing the abacus, the lines (or *termines*) have no real existence. Gerbert acknowledges the insubstantial nature of the building blocks of geometry, pointing out that 'a solid body is whatever is extended into three sides or dimensions; that is, whatever is extended into length, width, and height, just as a table (*tabella*) is able to be comprehended on seeing or touching, as if this thing is present, on which I write.'²⁰⁵ Having an image in front of the reader makes the process of using the abacus easier to understand, having an architectural image, also called a *tabella*, grants a monumental and a tactile quality to the image and the learning process. In essence,

²⁰³ Gillian R. Evans 'Sub-Euclidean', p. 107

²⁰⁴ Kinaesthetic teaching styles have received attention recently as part of a wider framework for pedagogies called VARK; an acronym for 'Visual, Audio, Reading, and Kinaesthetic', which attempts to accommodate a variety of learning styles, see Walter L. Leite, *et al.*, 'Attempted Validation of the Scores of the VARK: Learning Styles Inventory with Multitrait–Multimethod Confirmatory Factor Analysis Models', *Educational and Psychological Measurement*, 70 (2010), pp. 323-339.

²⁰⁵ 'Solidum corpus est quidquid tribus intervallis seu dimensionibus porrigitur, id est quidquid longitudine, latitudine altitudineque distenditur, sicuti est quidquid visu tactuque comprehendi potest, ut haec praesens, in qua scribo, tabella.' Bubnov, *Gerberti*, p. 52.

in order to learn aspects of geometry, and by extension the abacus *per corpuscula*, the teacher would need to relate the abstract elements of geometry (i.e., length, width, and height) to a physical object, and in this case a building is used.

Evans is the only modern scholar who has identified the correlation between the architectural language and the architectural images associated with the quadrivium, and methods of calculation in particular.²⁰⁶ It is helpful for the student if the *figura*, which are present for pedagogical purposes, can have some sort of structural quality allowing him to grasp abstract concepts in an alternative manner. Evans states, in relation to the figures in **J**, 'the abacus has columns; these are represented literally, as architectural columns [...] their figurative purpose is thus subordinated to the demands of habitual thinking.'²⁰⁷ While the columns of numbers are not the same as the architectural columns *per se*, because the columns frame the numbers, they do not take the place of the numbers, they are clearly proximal, and both are read vertically. The architectural arcading in the abacus texts, and indeed most likely in quadrivial texts as a whole, represents a mode of 'habitual thinking,' a symptom of making the abstract more concrete, turning columns containing information into models of stone columns. Architecture, used in this context, turns the ephemeral two-dimensional geometric tools of the point, line, and surface into as close an approximation of a solid structure as possible, thus reinforcing the information contained within it. As a result, the content of the text is less abstract and becomes more approachable, it literally becomes more solid in the student's mind.

To conclude this section, I would argue that architectural representation in geometrical works echoes the function assigned to them in arithmetical works; namely, providing a visual

²⁰⁶ Gillian R. Evans, 'Duc Oculum. Aids to Understanding in Some Mediaeval Treatises on the Abacus', *Centauros*, 19 (1975), pp. 252-263, here p. 254.

²⁰⁷ Evans, 'Schools', p. 85.

means to understand complicated material, but architectural representations in particular are evocative of the material world more broadly, and function as pedagogical images with the dual function of framing information, and emphasising the materiality of the knowledge contained within them. The use of architectural representation in eleventh- and twelfth-century abacus texts is not concerned simply with decoration, but instead accompanies the architecturally derived language in the accompanying text. Gerbert's works are pedagogically orientated and we may account for the presence of architecture on these pedagogical grounds. This explanation may help explain why some texts do not have architectural imagery, relying only on vertical lines to divide datasets. Some more advanced students may not have required them, and probably saw no reason to carry out the extra labour of depicting architecture.

Music

Music in the quadrivium is an abstract discipline: it considers the movement, proportionality, ratios and the relationship between number sets. Isidore of Seville describes it as ‘the practical knowledge of modulation [that] consists of sound and song,’ and then he discusses the close relationship between music and numbers.²⁰⁸ For Boethius the fundamental method of understanding music was grounded in the Pythagorean emphasis on number.²⁰⁹ The ninth-century author Sedulius Scottus links Augustine’s work, *De institutione musica*, and hence the subject of music in general, to the medieval canon tables. We will see that Sedulius links music’s concern for number with the numbers that appear on canon tables, and so, no consideration of medieval architectural representations would be complete without investigating medieval canon tables.

I have placed my analysis of the canon tables and their architectural appearance in the section on music to reflect Sedulius’ commentary on the subject. Initially it may seem counter-intuitive to relate music and the canon tables, but, as we will see, the tables were thought to rely on the sequential nature of numbers that Sedulius linked to the study of music. By understanding that the tables were created and used as numerical constructions, such as Sedulius described in Augustine’s work on music, the relationship between the two subjects – tables and music – should become clear in the course of this section. Lesley Smith writes that ‘number is a way of putting things together, but also of prising them apart’, and this is exactly what is required of the canon tables and numbers help accomplish that end.²¹⁰

²⁰⁸ Isidore, *Etymologies*, III. 14, and III. 22, pp. 95-98.

²⁰⁹ Boethius, *Fundamentals of Music*, trans. Calvin M. Bower (New Haven; London, 1989), p. xx.

²¹⁰ Lesley Smith, *The Ten Commandments: Interpreting the Bible in the Medieval World* (Leiden, 2014), p. 65.

Canon tables, which were intended to allow the reader to recognise biblical pericopes, present numerical sequences under arcades. These arcades frequently appear as frontispieces to medieval Gospel books. The early Middle Ages marks a highpoint in the presentation of canon tables in architectural frameworks, a practice which declines in the twelfth century. To look at canon tables, therefore, we will have to shift our chronological focus to an earlier period. However, this will allow discussion of the most common form of architectural representation in Gospel manuscripts. This shift in focus acts as a contextualising agent for the later architectural representations discussed in this chapter and others, some of which share the aims of the canon tables. As noted above, John E. Murdoch suggested that architectural canon tables influenced the use of architectural representations in the twelfth century, - a claim we will attempt to investigate.²¹¹ In this section, then, we will outline the development of the canon tables, before examining their link with contemporary music theory. We will then discuss architectural representations in music manuscripts from the twelfth century, to determine the continuing relationship between the diagrams associated with the texts and the impetus to present them in an architectural manner.

A canon table offers a concordance of biblical pericopes or similar events which occur in more than one Gospel. The tables appear at the beginning of Gospel books from late antiquity onwards, and spread throughout the former Roman Empire and beyond.²¹² Each Gospel section – of varying length – is assigned a number and a canon table.²¹³ There are ten canon tables in total, each offering different pericopes of the biblical text.²¹⁴ Two descriptive

²¹¹ See pp. 63-64.

²¹² Carl Nordenfalk, *Die Spätantiken Kanontafeln: Kunstgeschichtliche Studien über die eusebianische Evangelien-Konkordanz in den vier ersten Jahrhundert ihrer Geschichte* (2 vols., Göttingen, 1938), I, p. 45.

²¹³ There are 1351 numbers in total distributed among the ten canons, P. McGurk, 'The Disposition of Numbers in Latin Eusebian Canon Tables', *Gospel Books and Early Latin Manuscripts* (Aldershot, 1998), chap. XI, pp. 243-258, here p. 244.

²¹⁴ Canon I: Matthew, Mark, Luke and John; Canon II: Matthew, Mark, and Luke; Canon III: Matthew, Luke, and John; Canon IV: Matthew, Mark and John; Canon V: Matthew and Luke; Canon VI: Matthew and Mark; Canon

epistles are also usually included in the introductory material of medieval Bibles; these are Eusebius' letter to Carpianus, and Jerome's letter to Damasus.²¹⁵ Bishop Eusebius' (d. 339) letter is in Greek, but was widely translated during late antiquity; it is discussed in greater detail below in relation to Sedulius Scottus' commentary on it.²¹⁶ Among other things, Jerome's (d. 420) Latin letter also explains the canon table system:

*Singulis vero Evangelii, ab uno incipiens usque ad finem librorum, dispar numerus increscit. Hic nigro colore praescriptus, sub se habet alium ex minio numerum discolorem, qui ad decem usque procedens, indicat prior numerus, in quo sit Canone requirendus.*²¹⁷

Thus, when one reads the actual text of the Gospels the beginning of each passage is marked by two numbers, one in black and the other in red.²¹⁸ The black number indicates the number of the section, and red relates to the canon table in which it appears.²¹⁹ Alternatively, if one wished to know, for example, where Matthew and Mark offer similar accounts, one would open canon VI, the first number under the title of Matthew would relate to a passage in Scripture in Matthew. Straight across from this, in the equivalent number under Mark, this number would relate to the similar passage in that Gospel. This referencing system allowed the reader to efficiently identify references to biblical pericopes, perhaps for creating lectionaries or for

VII: Matthew and John; Canon VIII: Luke and Mark; Canon IX: Luke and John, Canon X: Singular readings in each of the four Gospels.

²¹⁵ For a full translation of this see: Harold H. Oliver, 'The Epistle of Eusebius to Carpianus: Textual Tradition and Translation', *Novum Testamentum*, 3 (1959), pp. 138-45.

²¹⁶ Both of these epistles frequently appear attached to medieval Gospel books, for example it would have appeared at the beginning of the Book of Kells, A.M. Friend Jr., 'The Canon Tables of the Book of Kells', in Wilhelm R.W. Koehler (ed.), *Medieval Studies in Memory of A. Kingsley Porter* (2 vols., Cambridge, 1939), II, pp. 611-41, here p. 614.

²¹⁷ 'Separately in the Gospels are numbered sections of unequal length, beginning with number one and increasing to the end of the books. This number is written in black before the passage, and it has under it a red number, which shows to which of the ten (lists) to proceed, with the first number to be sought in the list.' PL 29: 529D-530A.

²¹⁸ The division of Scripture into numbers was most likely carried out by Eusebius, c.f. McGurk, 'Disposition', pp. 243-258. These numeration is similar in method to the early modern method of assigning chapter and verse headings to Scripture. However, the Eusebian sections in no way correspond to what we would recognise as the chapter and verse of a text. For example, the first Eusebian section for Luke runs from Lk 1.1-34.

²¹⁹ This is an ideal state of affairs. Frequently, the numbers do not actually appear beside the Gospel text.

comparative scholarship. At no time in his description does Jerome mention the necessity of placing these tables within an architectural setting, but this is exactly what occurs in various later copies of the Gospel text.

The use of an architectural framework to present the tables occurs frequently, but not uniformly; in some examples a simple grid-diagram is used.²²⁰ Some of the very earliest examples of the type do use architectural elements to group particular elements together. Nordenfalk has identified several early Coptic fragments of papyrus with architectural canon tables for example.²²¹ These, he argues, represent an early stage in the development of the architectural framework, one which runs parallel to late Roman astrological tables, such as those in the Vatican (Vatican City, Biblioteca Apostolica Vaticana, MS Vat. gr. 1291, f. 22r) (fig. 39).²²² Nordenfalk also recognised that canon tables could be grouped into two categories; those that presented the tables over sixteen folia, and those over twelve folia, which he called the long sequence and the short sequence, respectively.²²³ The short sequence usually contained the same information as the larger canons, but condensed to fit in less space.

Later in the Middle Ages the architectural features of the canon tables became much more ornate; and were a highlight of the decorative features in some Gospel manuscripts. The Insular canon tables in particular are an excellent example of this. However, for our purposes we will discuss Carolingian examples because these are ones which can be associated with Sedulius Scottus' experience of Gospel manuscripts. One of the most influential set of canon tables are found in the Soissons Gospels.²²⁴ The Soissons Gospels establishes the importance

²²⁰ As in the case of the Book of Durrow (Dublin, Trinity College, MS 57). As already mentioned St. Gall, Cod. San. Gall. 48 does not contain any organisational schematic.

²²¹ Carl Nordenfalk, 'Canon tables on Papyrus', *Dumbarton Oaks Papers*, 36 (1982), pp. 29-38.

²²² *Ibid.*, p. 32.

²²³ *Ibid.*

²²⁴ Elisabeth Rosenbaum, 'The Vine columns of Old St. Peter's in Carolingian Canon Tables', *Journal of the Warburg and Courtauld Institutes*, 18 (1955), pp. 1-15, here p. 4; also A.M. Friend, 'The Canon Tables', pp. 621, 625.

of architectural imagery from the very beginning in an image of the adoration of the lamb (fig. 40). In it the artist has placed four columns in front of a pale structure.²²⁵ A sense of depth is created in the image by placing a red curtain behind a set of arches, but in front of the structure and have them drape around the flanking columns. The result is a stable composition with a foreground, middleground, and background. The canon tables are preceded by St. Jerome's prologue to the Gospels and Jerome's letter to Pope Damasus which explains how the tables function. The canon tables appear over twelve consecutive folios which conforms to Nordenfalk's short sequence.

The sense of depth created on f. 1v in the Soissons Gospels continues into the canon tables, albeit in a different form. For example, at the end of canon III (f. 9v) there are four columns (fig. 41). Those on the flanks have a pale marble effect; the two inner columns are brown with diagonal yellow lines along their entire length. The pale column to the right has been rendered in a light blue on the right side; the darker tone gives a sense of depth to the column. This technique appears in several other canons in the Soissons Gospels. For example, at the end of canon five (f. 10v) there are five columns with four intercolumnar spaces. The brown columns on the flanks have vertical fluting and blue capitals, giving a sense of symmetry to the composition. The right side of both these columns is rendered in a darker brown, which again gives a sense of depth to the structure. The artist has repeated the effect for the columns inside of the two flanking columns, where the blue marble on the right side is slightly darker than the rest of the column. The architectural qualities of this Carolingian example is very well considered and would appear to be a high-point of architectural representation in canon tables.

²²⁵ Don Denny, 'Allusions to Old Saint Peter's in the Soissons Gospels', *Marsyas*, 9 (1961), pp. 1-6, here p. 1.

It may be simply an historical accident that arcaded canon tables are relatively common: perhaps their decorative and attractive design promoted their statistical probability of survival, deemed to be too beautiful to reuse or destroy. Perhaps an architectural setting provided a simple graphical expedient which allowed the author to divide the table in a visually attractive manner. A simple grid system – like that in the Book of Durrow – was perhaps thought to be too stark, and too diagrammatic in style when compared to the illustrations from the rest of the book. In support of this hypothesis is the degree of freedom an artist seems to have had when adding the details of the architectural setting. If large selections of arcaded canon tables are compared to one another – from both the British Isles and Europe – no two are very much alike in their details.²²⁶

For example, taking examples of canon tables derived from the Court School at Aachen from the ninth century we can see that their stylistic characteristics are quite different. We have already seen that the Soissons Gospels use a relatively naturalistic set of columns. In addition to this, the tables are a type of beast canon tables; they indicate the particular gospel to which the intercolumnar space refers by placing the symbolic creatures associated with the evangelist over that space. The Harley Gospel (London, British Library, MS Harley 2788) uses the same technique; however, the overall effect is very different from the Soissons Gospels. This is another early-ninth century manuscript most probably completed in Aachen. Here, the artist has decorated the columns with floriated designs as well as knots. For example, part of canon I on f. 7r has five columns; the central column is divided into three sections, the top and bottom of which are knotted designs, while the middle portion uses a vertical scroll pattern coloured in green (fig. 42). Furthermore, the artist has provided a clear grid within the

²²⁶ G. Henderson, *From Durrow to Kells: The Insular Gospel-Books 650-800* (London, 1987), p. 138.

intercolumnar spaces which provides further definition when looking up the gospel sections. In the Harley Gospel the top part of the gospel sections is slightly obscured by acanthus leaf capitals; something which does not generally occur in the Soissons Gospels.²²⁷ So even in two relatively similar gospel books, the architectural representations, in the case of canon tables differs; no two canon tables are exactly alike. What is similar, however, is the presence of architectural elements.

The relative consistency of using architectural images to frame the canon tables has inevitably led to discussion of what is in fact represented or evoked by this architectural display.²²⁸ Nordenfalk 'conceived of them as an architectural atrium through which the mystery of Scripture could be accessed.'²²⁹ This statement has implicitly informed the opinions and conclusions of the few studies which mention the architectural qualities of the tables.²³⁰ As a result, it is worth spending time analysing whether Nordenfalk's statement accurately describes the motivations and conceptual framework of the canon table artist. If Gospel canon tables are 'an architectural atrium through which the mystery of Scripture could be accessed,' what role does architecture play in the mystery? It is unclear why Nordenfalk and others presuppose the architectural framework is mystical in nature. It is possible that architecture draws on particular Scriptural elements which indicate this, such as the Celestial Jerusalem, but these buildings do not appear in the Gospels. The only important building mentioned in the Gospels is Herod's Temple, during the temptation of Christ.²³¹ While we have primarily been

²²⁷ Nordenfalk, 'Kanonestafeln' (1937), p. 33. Here Nordenfalk indicates that later examples of the canon tables tend to disrupt the gospel sections with larger capitals.

²²⁸ Mary Carruthers comments on the consistency of the canon tables' representations, see: Mary Carruthers, *The Book of Memory: A Study of Memory in Medieval Culture*, 2nd ed (Cambridge, 2008), p. 118.

²²⁹ Brown, *Lindisfarne*, p. 304.

²³⁰ For example, Michelle Brown's comments derive from Nordenfalk's work on the canon tables. Later, Nordenfalk reiterates the idea, stating that the architectural representations give the tables a lofty appearance. C.f. Nordenfalk, 'Papyrus', p. 30.

²³¹ For example, Mt 4. 1-11.

examining the Carolingian examples of canon tables, it would appear that the artist of the Book of Kells did not have the Temple in mind when it came to drawing the canon tables. The temptation scene is already depicted in the body of the manuscript, the building has no arcading; instead it resembles the steeply gabled churches of early medieval Ireland.²³² As a result, in at least one case it is possible to say with certainty that the canon tables do not represent the Temple at Jerusalem. Assigning the tables mystical properties seems premature in the context of never having consulted Sedulius' commentary on them.

The canon tables were, for Sedulius at least, a mathematically based construction rooted in the *quadrivium*, making them an example of medieval applied science. Sedulius notes, *Et notandum quod cum ipsum capitulorum numerum paulatim a primo incipere dicat, deinde secundo, non ait postremo a tribus licet id consequentia constructionis exigat. Sed maluit dicere postremo tres quod non sine subtilitate arithmeticae disciplinae.*²³³ Sedulius recognises that the sequential nature of numbers allows for a clear and accurate indexing system for the Gospels. He understands the tables to be underpinned by an arithmetical foundation, so that they belong to the study of the quadrivium. Whilst the numerical basis may seem obvious to the modern reader, it is key to the functioning of the canon table. For clarity's sake the chapter numbers run from one onwards, thus giving each chapter in each Gospel a unique reference; the linear nature of this system allowed the table to function efficiently. Moreover, Sedulius states *legi beati Augustini primum de musica librum itaque post primum et secundum postremo iii esse ordine dicit.*²³⁴ The importance of a reliable numerical sequence defines the

²³² Tomas O'Carragain, *Churches in Early Medieval Ireland: Architecture, Ritual and Memory* (New Haven, 2010).

²³³ 'And it ought to be noted that about the number of the chapters, he says to proceed bit by bit from the first, next to the second; he does not say the following, "the sequence of the construction may finish from the third [part]." But he preferred to say the following, 'three, which is not without the skilful art of arithmetic.' Esposito, 'Hiberno-Latin', p. 88.

²³⁴ 'I have read in the first book on music by Saint Augustine, and he says 3 comes in order after the first and the second.' Ibid. I have indicated the cardinal value of three in this translation to indicate the difference between the cardinal and ordinal properties of Sedulius' writing.

mathematical properties of the canon tables, but surprisingly Sedulius refers to Augustine's treatise on music, and not to one of the many late antique or early medieval treatises on arithmetic or number theory.²³⁵

The canon tables are a mathematical based system for ordering the Gospel pericopes, one which relies on the number theory espoused in Augustine's book on music. Augustine's treatise was rediscovered during the early-modern period and became influential thereafter.²³⁶ In the first book, Augustine describes the importance of numerical progression when determining the relationship between the numbers and musical modes. Sedulius' emphasis on the properties of the number three may stem from Augustine's own emphasis, where he writes that in counting there must be a beginning, middle, and an end; three is the smallest number in which all three properties exist.²³⁷ Later, in chapter twelve, Augustine remarks on the importance of mathematics in musical theory, highlighting that 'the two beginnings,' (i.e., one and two) add up to three, and that three 'is the first number with complete unity.'²³⁸ Sedulius must also have in mind Augustine's broader discussion of numbers which states that, 'lengths of time which are unequal must be related according to a certain *numerus*, 'number,' 'mathematical expression,' 'proportion.'²³⁹ The implication is that the various numbers have a more fundamental relationship with each other, beyond their appearance in a sequence. The linear property of number allows for individual reference points to be applied to an index, and these reference points form the core of the canon table system. In any case, for Sedulius the

²³⁵ For example, Boethius' treatise on the subject, or Isidore of Seville's *Etymologia*, cf. Isidore, *The Etymologies*, III., p.89.

²³⁶ Brian Brennan, 'Augustine's "De musica"', *Vigilliae Christianae*, 42 (1988), pp. 267-281, here p. 267.

²³⁷ 'M[agister]. Ergo ut totum aliquid sit, principio et medio et fine constat. D[iscipulus]. Ita videtur. M. Dic itaque nunc, principium, medium et finis, quo numero tibi contineri videantur. D. Arbitror ternarium numerum te velle ut respondeam: tria enim quaedam sunt, de quibus quaeris.' PL 32: 1095.

²³⁸ Saint Augustine, *St. Augustine's De musica: a Synopsis*, trans. W.F. Jackson Knight (London, 1949), I, 12., p. 16. Three is the sum of its previous two numbers making it the first perfect number.

²³⁹ Ibid., I. 9., p. 14.

canon tables were rooted in number, making them an applied science during this period, and associated with the subject of music in particular.

While Sedulius' commentary on Eusebius' letter to Carpius is the clearest contemporary description and discussion of the tables, at no point does he mention architecture, or any requirement for an architectural framework. Despite this, the vocabulary used, and the images he conjures are directly connected to the type of language used in architectural descriptions and references. The subject pervades the language, and in the process, it becomes clear why an architectural framework suits the implementation of the canon tables. In order to demonstrate this, I will first examine the overall format of the drawings. Then I will analyse the vocabulary used by Sedulius and its correlation with contemporary architecturally-orientated language used both in Scripture and during the early medieval period.

The architectural canon tables present an orthogonal elevation of a facade, a relatively rare format of architectural representation in the early Middle Ages.²⁴⁰ For this reason I will proceed from what is certain about facades, and then examine how this can help us understand the canon tables. There are various descriptions of architecture throughout Scripture, some of which are concerned with the outward appearance of the building, as well as the interior decoration. The best known is the Temple at Jerusalem, built by King Solomon. The description appears in 1 Kings 6, and 2 Chron 3, the two descriptions are broadly in line with each other, with few contradictions.²⁴¹ However, the most extended architectural description

²⁴⁰ This is indicated in the introduction to this thesis, elevations usually appear attached to plans as a conflation of the two views.

²⁴¹ The height of the structure is given as 30 cubits in 1 Kings 6, and 120 cubits in II Chron 3. One of the earliest commentaries on this disparity is Bede's commentary on the Book of Kings. He argues that the larger measurement was true, which was accepted by later authors, Bede 'In Regum librum xxx quaestiones', *Beda's Venerabilis opera: Opera Exegetica*, CCSL 118 (4 vols., Turnholt, 1983), II, p. 303-304.

appears in Ezekiel 40-48, concerning the prophet's description of the heavenly Temple complex which is to be built in Jerusalem when the Israelites return to the Land. Ezekiel 40 uses two words, *facies*, -i and *frons*, -tis, to describe the appearance of an outward wall of structure.²⁴² *Facies* continues its usage from 1 Kings 6, where it is used to describe the appearance of an external wall. *Frons*, when used as a noun, seems to be much more general in nature, describing a wall that may combine multiple architectural elements on the single external wall. *Frons* may be used to describe a lengthy facade, or sequence of chambers over multiple structures (e.g., Ez. 40: 10), whereas *facies* describes only a single structure.

This dual usage of *facies* and *frons* continues into the medieval period, but becomes slightly more certain of its contextual references. For example, in *De templo* Bede is not as concerned with the historical appearance of Solomon's Temple as he is with the allegorical and typological readings of the structure.²⁴³ Bede makes a comparison between the faces of the angels, which stand before God, and the exterior wall of the temple: *Sic ergo pedibus stabant erectis, sic alas suas ad auro textos oraculi parietes extendunt, ut facies habeant ad domum versas exteriorem.*²⁴⁴ Still the reference is not clear, and Bede does not use the word again in an architectural context. In contrast, *frons* takes on the role of orientating the reader when describing architectural elements, and especially the *porticus*.²⁴⁵ *Porticus* is a difficult

²⁴² For example, '*et ante faciem portae quae pertingebat usque ad faciem vestibuli portae interioris quinquaginta cubitos;*' (Ez. 40: 15), 'From the front of the gate at the entrance to the end of the of inner vestibule of the gate was fifty cubits.'; and '*et fecit frontes per sexaginta cubitos et ad frontem atrium portae undique per circuitum*' (Ez. 40: 14), 'he made fronts of sixty cubits, and o the front of the court of the gate on every side round about.'

²⁴³ Bede, 'De templo Solomonis', PL 96:735D-808A. Here translations are taken from Bede, *Bede: On the Temple*, trans. Seán Connolly (Liverpool, 1995).

²⁴⁴ 'Thus they stand on raised feet, they extend their wings weaved with gold to the walls of the oracle, as the faces have turned to the exterior house.'

²⁴⁵ Bede, 'De templo Solomonis', PL 96 :754B.

word to translate as it changes over time. Connolly describes it as a colonnade, or an area ringed with columns.²⁴⁶ Adomnan does not use either word in his *De locis sanctis*.²⁴⁷

Sedulius uses the term *frons* four times in his commentary on Eusebius' letter and description of the canon tables. He uses it twice adjectivally, *Quia neque paulatim in fronte cuiuslibet evangelii a primo canone incipiens*, and *ut paulatim a primo in fronte evangelii atque secundo inchoet*.²⁴⁸ The next time it appears, and the first as a noun, is in Sedulius' quoted translation of the letter: *quem demonstrat tituli subnotatio, continuo scire potueris ex superscriptionibus, quas in fronte notatas invenies*.²⁴⁹ In his commentary on this section, Sedulius continues this substantive usage: *Quos titulos in fronte atque exordio distincte canonum serie notos invenies*.²⁵⁰ *Facies* is never used during the commentary. Sedulius uses *frons* to describe a place in relation to the canon tables, but not in a sequential sense; that is, he does not use it as a synonym for 'the beginning of the Gospel;' to do this he uses the term *principium*. According to this terminology Sedulius assumes the reader to know, from examining the *frontes*, the sequence of the canon tables. Sedulius points the reader towards the *frontes*, on which the titles of the Gospels are placed.²⁵¹

This sort of orientation framework provided by *in fronte* conforms to its usage in Scripture, described above. The architectural canon tables display a facade or a series of

²⁴⁶ Bede, *Temple*, p. iii. The term can also refer to a gallery, or a walkway above the ground floor in a building, Isidore of Seville specifically mentions that it is an uncovered walkway, p. 307. See also, Éamonn Ó'Carragáin, 'The Term *Porticus* and *Imitatio Romae* in Early Anglo-Saxon England', in Helen Conrad-O'Briain, *et al.*, *Text and Gloss: Studies in Insular Learning and Literature Presented to Joseph Donovan Pheifer* (Dublin, 1999), pp. 13-34.

²⁴⁷ The words only appear in relation to their description of the face (*facies*) and the forehead (*frons*) in Isidore's *Etymologia*: Isidore of Seville, *The Etymologies*, p. 233.

²⁴⁸ 'It does not begin at the front of the gospel from the first canon.' and 'so that by degrees it starts on the front of the gospel to the second.' Esposito, 'Hiberno-Latin', p. 89.

²⁴⁹ 'It demonstrates that in the subscription of the title, you will be able to know immediately from the writing above, what you will find written on the front [*in fronte*].' Esposito, 'Hiberno-Latin', p. 90.

²⁵⁰ 'You will find those titles on the front [*in fronte*] and at the beginning of each canon.' Ibid.

²⁵¹ *Titulus* refers to the titles contained at the top of the page (*super/surpascrptiones*), it simply states the name of the Gospel to which the column refers.

arcades with multiple architectural elements embedded within them. They do not merely display a wall, something for which the term *facies* would have been better suited, but a frontage, a *frons* with many parts and elements. Furthermore, if the reader orientates himself in relation to the building frontage, they stand before, in front of, the building. The reader is placed within an atrium (*porticus*), surrounded by colonnades. *Frons* indicates, then, both the location of the viewer, and the object of their observation. This type of language indicates Sedulius' desire to describe both a machine for locating Gospel passages and a specific *locus*, while simultaneously emphasising the materiality of the story within the Gospel.

This *locus*-centred visualisation is further encouraged by Sedulius in his description of the gaps between the columns which contain the Gospel chapter numbers. He uses the terms *via* (road) and *tramites* (path) to describe these areas, which appear as inter-columnar spaces in the architectural canon tables. Sedulius uses the terms a number of times:

*Licet in quibusdam locis non nisi duo numeri tibi oppositi repperiuntur, sicut in fronte tramitum secundi canonis apparet [...], ut quattuor numeros qui in primo canone continenter iior numerosos tramites in quibus multiplex capitulorum numeros describitur dictos esse intellegamus.*²⁵²

The word does not appear again until the end of the commentary, where Sedulius states:

Quem varium capitulorum numerum contines in mente scilicet atque memoria colligens statim eosdem capitulorum numeros quos ante in canonum subnotatis tramitibus conspexeras per singulos evangelistas hoc est per singula evangelia adpostios ac superscriptos esse videbis atque eosdem in suis propriisque locis evangelistas similia

²⁵² 'Unless two opposing numbers are returned to you in particular places, such as appear on the front [*fronte*] in the column [*tramitum*] of the second canon [...], let us understand the four numbers which run continuously in the first canon which describes the many numbers of the chapters as the four pathway numbers having been spoken about..' Esposito, 'Hiberno-Latin', p. 87.

*dixisse repperies.*²⁵³ The synonym for *tramites*, *via* appears just before this sentence: *Ad reliqua evangelia ipso vario numero viam tibi praebente teque ad propria capitulorum loca ducente recurris.*²⁵⁴

The type of image Sedulius describes becomes clear from his language. The *tramites* are written below the *titulus* which shows the Gospel each individual column represents, in much the same way that the architectural canon tables work. It is unclear where Sedulius conjures this type of language from, because neither *tramites* nor *via* appear in Eusebius' original letter, nor do any similar Greek terms. For Sedulius, *tramites* is a technical term to indicate the location of the chapter numbers to which one refers when searching for the relevant pericope. Isidore describes *viae* as 'Lanes [which] are the narrow spaces that lie between rows of houses,'²⁵⁵ although he contradicts himself somewhat later on by saying 'A road (*via*) is the place where a vehicle can go, and it is named road from the vehicles (*vehiculum*) riding on it.'²⁵⁶ He briefly and indirectly discusses *trames* in the same section, mentioning the suffix – *itus*: 'Crossways (*trames*) are passageways cutting across (*transversus*) fields, or straight roads, so named because they 'pass across' (*transmittere*).'²⁵⁷ By using the term *tramites* Sedulius gives the inter-columnar spaces depth, conjuring a space through which a person may pass; they hint at the intertextual nature of the canon tables, acting as a literal crossroads for the events of the Gospels. The columns are a nexus through which the different Gospels interact, cross-referencing both themselves and each other, where they cut across each other for sake

²⁵³ 'You maintain in the mind that variety of chapter numbers, and those same chapter numbers immediately collect in the memory, you may have seen those, concerning each Gospel, in the table written beneath in the columns [*tramitibus*], that is concerning every Gospel was placed there, and you may see above and the same in its right place according to the Gospel, all this may be discovered.' Esposito, 'Hiberno-Latin', pp. 90-91.

²⁵⁴ 'For the remaining Gospels you return to the column [*viam*] with the different numbers, having been presented to you, leading you to the proper place of the chapters.' Ibid., p. 90.

²⁵⁵ Isidore of Seville, *Etymologies*, p. 306.

²⁵⁶ Ibid., p. 316.

²⁵⁷ Ibid.

of the reader. By using this type of language Sedulius' encourages the reader to step through the columns on the page; the effect is perpetuated in the Carolingian Gospels, discussed above, by the addition of shading to the columns, giving them a naturalistic character.

Having established the overall structural elements and their relationship with contemporary architectural terminology, we turn to the individual elements that Sedulius describes, to examine how they contribute to the efficacy of using an architectural framework for the canon tables. The *capitula* are one of the most important elements in the use and description of the tables; they provide the basic units of Scripture to which one refers. As mentioned, Sedulius' main concern, when discussing the nature of the chapters, is the arithmetic which underpins it. He dedicates a large amount of writing to the interconnection between two Gospels; they are at the centre of the table's machine. However, *capitulum* is a problematic word, and carries at least one architectural synonym.

The most popular usage of *capitulum* perfectly matches that in Sedulius' commentary; it designates individual and separate literary units, similar to the term 'chapters.' However, *capitulum* also refers to an area within a church; a usage which becomes more popular later in the period, but that was certainly used in this manner in an Irish context before Sedulius' commentary. The word appears regularly in the eleventh century, especially in annals and charters which discuss architectural subjects. For example, in the chronicle of the church at Anjou, the entry for 1156 reads:²⁵⁸ *Stephanus de Rupe Fulcaudi '... dum prioratu hujus coenobii fungeretur, capitulum hujus ecclesiae sub dormitorio silum, arcuato opere, (sub) tam egregia venustate et artificiosa subtilitate construxit.*²⁵⁹ *Capitulum*, here clearly refers to the chapter-

²⁵⁸ Victor Mortet (ed.), *Recueil de textes relatifs à l'histoire de l'architecture et à la condition des architectes en France au moyen âge* (2 vols., Paris, 1911) I., p. 23

²⁵⁹ 'Stephen of Rupe Fulk, while prior of this monastic order, founded [sited] the chapter house of this church behind the dormitory, worked in an arc, which came together to make attractive work, and it was artfully and carefully made.' The same term is used later in the entry for 1174.

house of a monastery, the common location of which, in a cloistered monastery, was under the dormitory. An earlier text, the architectural customs of the Cluniac monks at Farfenses, describes the standard measurements for various architectural elements: *Ecclesia longitudinis CXL pedes habeat, altitudinis XL et tres; fenestrae vitreae CLX. — Capitulum vero XL et V pedes longitudinis, latitudinis XXX et quatuor.*²⁶⁰ There are many more examples from this period, making it explicitly clear that *capitulum* refers to the meeting house of a chapter, as well as referring to a literary chapter.

By considering architectural representations in canon tables many of the examples have derived from the early Middle Ages; however schematic representations continue to appear in twelfth-century manuscripts of music. In these texts the architecture assumes the role of a didactic image which orders particular datasets. Manuscripts of Boethius' *De institutione musica* are only rarely illustrated, but tend to contain a large number of diagrams.²⁶¹ Frequently the illustrations which do appear are only incidental or frontispieces to the entire work; they are not well integrated into the subject or actual text.²⁶² Seebass highlights three illustrative schemes in medieval music texts, the final one of which considers the inclusion of schematic material; those which illustrate the division and proportional relationships between numbers are very common.²⁶³ Seebass, however, does not highlight the unusual and sometimes architectural nature of this diagram type. In Oxford, Bodleian Library, MS Selden Supra 25 for instance there is a clear and unique visual correlation between the

²⁶⁰ 'The church is 140 feet in length, in height 40 and 3; with 160 glass windows. The chapter-house [chancel] 40 and 5 feet in length, 30 and 4 in width.' The description of the dormitory (160 feet in length and 34 in width) directly follows this sentence. Mortet, *Recueil*, I., p. 133.

²⁶¹ Tilman Seebass, 'The Illustration of Music Theory in the Late Middle Ages: Some Thoughts on Its Principles and a Few Examples', in Andre Barbera (ed.), *Music Theory and Its Sources: Antiquity and the Middle Ages* (Notre Dame, Ind., 1990), pp. 197-234, here, p. 200.

²⁶² *Ibid.*, p. 211.

²⁶³ The other two schemes consider incidental and small figures, such as historiated initials, and frontispieces to Boethius' work.

diagrams and architectural representations, especially those associated with book one. For example, f. 54r contains a portion of book one, chapter twenty of Boethius' *De institutione musica*, which is concerned with the properties of 'chords' and their names.²⁶⁴ Two diagrams appear in this section, the first of which illustrates the different notes of the heptachord from the *hypate* to the *nete* (fig. 43). Boethius introduces the diagram, stating, '*ut sit descriptio haec.*'²⁶⁵ The diagram arranges the notes in a vertical arrangement from top to bottom. There are several unusual aspects to the diagram. First, it is inverted in relation to the rest of the text; when the manuscript is turned around, the lowest note, the *hypate*, appears at the top and *nete*, the highest note, is placed at the bottom. The diagram is also surrounded by red ink, with double arches on the left side (i.e., left side when the manuscript is turned upside down). The red frame may have been completed at a different stage. For example, the thin red line running alongside the names of the notes contains a curved capital extending to the left, an architectural addition supported by the capitals on top of the lines on the terminal ends of the diagram, which joins with the two arches to the left side. The brown ink of the *tituli* is used as bullet points which mark each note, and emphasise the orderliness of the diagram; however, it is unclear which ink was used first.

The second diagram appearing on f. 54r lacks any words to indicate the relationship between the different notes. Instead the artist presented a piece of architecture, but has failed to include any other information. The eight notes of the octachord should be illustrated in this section, presented in a vertical arrangement similar to the diagram above.²⁶⁶ The architectural diagram in MS Selden Supra 25 is a relatively elaborate structure with two arches placed on top of one another flanked by arches and windows on the second level and

²⁶⁴ *De additione chordarum earumque nominibus*, PL 63: 1183B

²⁶⁵ 'as is here [in] the diagram.'

²⁶⁶ The addition notes of *trite* is placed between *paramese* and *paranete*, cf. Boethius, *Fundamentals*, I. 20, p. 35

surmounted by sloping roofs. The same approach of presenting an architectural diagram with *tituli* reoccurs on f. 54v (fig. 44). On the right is an architectural representation which seems to present a roof placed towards the spine of the manuscript and three arches of different sizes on the other side. There is no architectural or structural sense to the diagram. However, there are ten horizontal lines placed in a column in the 'interior' of the structure. This diagram is intended to present the nine chords of the enneachord, which appears towards the end of chapter 20 of book 1.²⁶⁷ These would have accommodated the *tituli* which are normally associated with the diagram in this location. It is unclear why the artist has not completed the figure.

The remaining architectural drawings in Selden Supra 25 are complete. For example, f. 55r contains an arcade which runs down the outer margin of the manuscript, with elaborate floriated designs extending out of the six arches (fig. 45). F. 55v is the most fanciful architectural drawing to appear in the manuscript (fig. 46). It lies at a ninety degree angle to the text, and is constructed of a series of arches with decorated vaulting. Four arcaded arches comprise the primary structural group of the drawing, each of which encompasses groups of three and four arcades at the level of a church gallery. Extending out of the columns, further arches link the different four structural groups together in different ways, with one overall encompassing arch.²⁶⁸ Blue, red, black, and green ink combine to form the conspicuous diagram, with all the *tituli* present at ground level and set within the arches. There is another arcade on f. 56r, with a group of nine arches some of which are coloured (fig. 47). The arcade on f. 57r is slightly different in form, with elongated arches rising from the bottom of the text block to the middle of the page (fig. 48). It is filled with the names of different notes. The final

²⁶⁷ Ibid., p. 35. The additional note is *hyperhypate* and should appear at the top of the vertical arrangement

²⁶⁸ The effect is not unlike the unusual arrangement of the clerestory level in Oxford's Cathedral.

architectural drawing appears on f. 57v, but it is incomplete, with no columns, and only two arches set within a green vault (fig. 49).²⁶⁹

The use of explicitly architectural representations for the intended diagrams does not, as far as I have been able to check, occur in any other manuscript, and thus would seem to be the sole work of the artist and scribe of Selden Supra 25. There is no known provenance for the manuscript, making it impossible to determine more information about the artist or his wider intentions. Aside from the incomplete diagram on f. 54v none of the diagrams overlap with the accompanying text, indicating that the diagrams conform to the general dimensions left by the scribe. This could indicate that the architectural representations were not a momentary flourish, but an intentional decision determined by scribe and artist, if they were different people. While the architectural diagrams which appear in Selden Supra 25 are unique in the context of Boethius' *De institutione musica*, they do point towards a tendency to read musical diagrams as alluding to architectural forms. The different notes are indicated as a line, and then the entire set of seven, eight, or nine notes is joined together by a series of arches. Reading such an assembly of geometric forms as architectural in some way highlights the fluidity of reading the diagrams.

This section has demonstrated that the common setting of Gospel canon tables in architectural frameworks may have influenced how the canon tables were considered and used in the Middle Ages. Sedulius' commentary links the numerical system used to create the tables to the subject of music, likening the progression of numbers in medieval music theory to the tables. The tables, as described above, are the clearest parallel with Hugh of St. Victor's description of an indexing system for the psalms. Linear forms are arranged in a numerically

²⁶⁹ There is a diagram on f. 57r, but it is not clearly architectural. There is also a circular diagram on f. 57v, set just below the incomplete architectural figure.

consistent manner, allowing for clear organisation of the material which has already been stored in the memory. In the process of describing the table, Sedulius used architectural or spatial terminology such as *via*, *trames*, or *frons*. Later, in the twelfth century, architecture is used to order musical diagrams in Boethius' *De institutione musica*. In diagrams such as those which appear in Boethius' *De musica*, there is no concern for the structural properties of the architecture; the forms are arranged to suit the material, arranging them in a grid-like pattern to organise particular diagrams. Architectural representations are used in particular not, perhaps, to create a 'mystical' setting for the Gospels, but to ground the information included in the tables a tangible manner, one that reflects that type of language Sedulius uses in his commentary. As we have already noted, Murdoch suggests that other architectural representations in medieval didactic texts were modelled on the canon tables. This could certainly be the case; however, it can be noted that in arithmetic, geometric, and musical texts of the period, all architectural representations share the same purpose of organising data.

Astronomy

Up to now we have argued that the inherent physicality of architecture grounds the abstract nature of the quadrivial subjects of arithmetic, music, and geometry; it encourages the reader to interpret the material in a more tangible manner. If this theory is correct, even in part, it begins to explain why architecture was a common framework in quadrivial manuscripts. This section approaches the theory from the opposite end. It argues that the physical nature of astronomical data, grounded in the stars and planets, should not need the addition of an architectural framework, and thus architectural representations should not be as common in astronomical textbooks. Astronomical tables, unlike those examined in the earlier sections, refer to objects in the physical world, and not to abstract information. Astronomical tables usually refer to the position of objects in the night sky; similarly, tables in treatises on the astrolabe detail the positions of celestial objects to be placed on the astrolabe itself. The inherent materiality of this type of data, and its tabular appearance in manuscripts, should negate the reason for using architectural frameworks if our argument is at all correct. If architecture does not appear in astronomical texts, this would support the theory that architectural details were added for pedagogical reasons, and not mere ornamentation wielded to alleviate the boredom of the medieval reader.

The study of astronomy in the Middle Ages was dominated by Roman writings on the subject. Several texts formed the core of astronomical knowledge spanning from late antiquity to the twelfth century. These texts were: Pliny the Elder's *Natural History*, Macrobius' *Commentary on Cicero's Somnium Scipionis*, Martianus' *Marriage of Philology and Mercury*, and Calcidius' *Commentary on the Timaeus of Plato*.²⁷⁰ Calcidius' (d. fourth or fifth century) work

²⁷⁰ Eastwood, Grasshoff, *Planetary Diagrams*, pp. vii, 4.

formed the basis of medieval knowledge of the works of Plato, and comprised the 'sum total of the works of Plato known [...] in the twelfth century.'²⁷¹ Plato's work offers an interpretation of the mechanisms which govern the universe, emphasising the importance of the four elements and their interaction with one another. Calcidius includes a reference to the importance of *plana figura* for understanding astronomical models and aspects of the quadrivium, implying the importance of diagrams when reading the text.²⁷² From the Carolingian period onwards there was a tendency to supplement and include diagrams with alternative texts, when they explained relevant parts of the text.²⁷³ The evolution and association of these diagrams with the formative astronomical texts has been described in some detail by Bruce Eastwood over several papers and books.²⁷⁴ The diagrams presented the objects of the night sky in a literal schematic model of the universe, with the earth as the centre and the motion of the planets represented by a series of concentric circles emanating from the earth. For example, the Plinian diagram for the order of the planets 'most commonly takes the form of seven small circles placed close together horizontal;' the names of the planets are attached to these small circles, conveying the information efficiently via visual means (fig. 50).²⁷⁵ The presence of representational diagrams means that architectural additions would not have been appropriate, because a building would disrupt the pedagogical objectives of the diagram. However, there are astronomical tables in a number of manuscripts to which architectural content would have been suited, as seen in other quadrivial texts. However, there

²⁷¹ R.W. Southern, *Platonism, Scholastic Method, and the School of Chartres* (Reading, 1979), p. 7. See also, Edward Grant, *Science and Religion 400B.C. – A.D. 1550, From Aristotle to Copernicus* (Westport, Conn., 2004), pp. 93-94.

²⁷² Calcidius, *Timaeus a Calcidio translatus commentarioque instructus*, edited by J.H. Waszink (London, 1962), p. 58.

²⁷³ Murdoch, *Albums*, p. 360.

²⁷⁴ E.g., Bruce Eastwood, *The Revival of Planetary Astronomy in Carolingian and post-Carolingian Europe* (Aldershot, 2002); and, Bruce Eastwood, *Ordering the Heavens: Roman Astronomy and Cosmology in the Carolingian Renaissance* (Leiden, 2007).

²⁷⁵ Eastwood and Grasshoff, *Planetary Diagrams*, p. 23.

has been no scholarly discussion of the appearance of western astronomical tables which became associated with the study of the night sky.²⁷⁶

Tables appear in a variety of astronomical texts. One particularly common example is in those concerned with the construction and function of the astrolabe. The text, *De liber astrolabio*, states it will teach the willing reader about the celestial sphere, geometrical measurements, and the manner in which one may determine the hours of the day.²⁷⁷ Bubnov lists the work as doubtfully attributed to Gerbert of Aurillac, and lists the probable author as Hermannus of Reichenau (d. c. 1052; also known as Hermannus Contractus).²⁷⁸ Drecker's and Bubnov's editions differ from each other, but both provide the reader with the correct placement of the stars on the astrolabe.²⁷⁹ Bubnov's edition only includes a single table which demonstrates the positions of the constellations in particular periods of the months. The table does not have any architectural details, and is depicted in a highly schematic manner.²⁸⁰ As Eastwood has shown, astronomical diagrams had a tendency to undergo alterations, and because one example appears in a particular manner does not mean all examples appear in the same style, so we will need to determine the development of the table associated with the text.²⁸¹ Hermannus' work receives closer scholarly attention from Drecker who provides a

²⁷⁶ There are discussions of examples of astronomical tables within the Islamic cultural sphere, see: E.S. Kennedy, *A Survey of Islamic Astronomical Tables* (Philadelphia, 1956); also in relation to the late-medieval period, José Chabás, *A Survey of European Astronomical Tables in the late Middle Ages* (Leiden, 2012).

²⁷⁷ Bubnov, *Gerberti*, pp. 109-147, p. 114.

²⁷⁸ Drecker concludes that the work is certainly by Hermannus, J. Drecker, 'Hermannus Contractus Über das Astrolab', *Isis*, 16 (1931), pp. 200-219, here p. 201.

²⁷⁹ For example, Bubnov's edition begins: *Quicunque [sic] astronomicae discere peritiam disciplinae [...]*. 'Whosoever [wishes] to learn the practical knowledge of the astronomical discipline [...]' Bubnov, *Gerberti*, p. 114. Drecker's edition begins: *Hermannus Christi pauperum peripsima [...]*. 'The filthy Hermannus [a follower] of the poor Christ [...]' Drecker, 'Hermannus,' p. 203.

²⁸⁰ This may be contrasted with other tables in Bubnov's text, which include encompassing arches when they appear in a manuscript. For example, on p. 200 Bubnov includes a schematic representation of a diagram in which arches very clearly appeared in the original exemplar.

²⁸¹ Eastwood and Grasshoff, *Planetary*, p. 18.

critical edition of the text, and also includes a second table. First, let us examine this second Hermannus table, which provides a case-study for examples of astronomical tables.

The Hermannus diagram in Drecker's edition describes the relative positions of particular stars on the astrolabe, in order to place them appropriately on the largest of the astrolabe's plates. The table is made of four columns: the latitude; the height (both relative to the astrolabe); the zodiac sign in which the star appears; and the star itself, which is given its Arabic name. The numerical coordinates of latitude and altitude refer to a set of 360 divisions already made on the astrolabe, describing exactly where to place the stars.²⁸² The table also defines the sign of the zodiac in which to place the aforementioned star, but this information would not seem to be vital in placing the star itself.²⁸³ When Hermannus refers to the table he does not call it a *tabula*, instead, he simply refers the reader to the following page.²⁸⁴ Compared to the interchangeable use of *figura* and *tabula* in relation to explicitly geometrically formed objects, it would seem that Hermannus conceived of this particular table in slightly different terms; in essence this table is not strictly the same as the tables which appear in the arithmetical or geometrical texts, a change signified by the language used to describe it.

Drecker's edition presents the table as a simple grid in four columns and enumerates the positions of the stars in each row. This sparse style broadly reflects the table's appearance in the manuscripts which contain the work. For example, Paris, BnF, MS lat. 15708 is a twelfth-century manuscript from the Augustinian abbey of Saint Victor in Paris. It contains a version of Hermannus' *Liber de Astrolabio* (f. 37v), including the table under discussion (fig. 51). Here it is presented as a plain, and highly schematic table with no architectural elaborations of any

²⁸² *Quo maximus a regula circulus tangitur, tot gradus in eodem maximo circulo, qui in CCCLX divisus est, iterum numera quot idem stela in eadem ascriptos videris pagina.* Drecker, 'Hermannus', p. 208. 'With which the large circle is touched by the rule, there is as many steps in the same larger circle, which is divided into 360.'

²⁸³ Ibid.

²⁸⁴ E.g. Ibid. '*prius in pagina subscripta.*' '*ut praefata pagina subitus ascripta docet.*'

kind. It appears in the top left corner of the folio in a rather cramped style and is not highlighted in any way. It is also missing the titles which appear at the top of the MS **A** (Oxford, Bodleian Library, MS Auct. F. 1. 9), which will be examined in detail below. This same table, in a very similar form appears in another French manuscript from approximately the same period, although it does include material from the thirteenth century. Two British examples display almost exactly the same lack of architectural details in their presentation of the material. One such example is the table which appears in Oxford, Bodleian Library, MS Digby 174, which lacks any ornamentation, and displays the table over a full opening (fig. 52).

Another example where the titles are included at the top of a table but there is no architectural framework to accompany it, appears in Oxford, Bodleian Library, MS Digby 51, f. 19v (fig. 53). Here the Hermannus diagram appears in the top left corner, similar to its positioning in the French manuscripts described above.²⁸⁵ The Hermannus text here is a twelfth-century English copy, although its specific source is unknown. Unlike the previously discussed manuscripts the titles appear above the top line, defining the criteria of the columns underneath. However, examining the lines closely, it appears that the titles have been inserted at another point in time to the rest of the table. Compared to the script in the rest of the text and even within the table itself, the text of the titles is clearly smaller. The ink is also lighter in colour. The titles may have been added later, adding further information for the reader. At no other point in the manuscript does writing appear above the top script marking line, which may indicate the writing underneath it, i.e. the table, may have been present when the author inserted the titles. Supporting this thesis, there is a second copy of the table inserted as f. 20r in the same manuscript. This smaller folio contains only the Hermannus table with the titles

²⁸⁵ Oxford, Bodleian Library, MS Digby 51 is a large collection of miscellaneous mathematical texts assembled in the post medieval period.

above, and with variant descriptions under the *stellae* column. While the titles are included in this section it may be argued that the insertion of f. 20r represents an alternative reading of the table which was added to the manuscript, after which a later hand took the column titles from the insertion in f. 20r and added them to an already present table on f. 19v. This interpretation remains speculative, however it does reinforce the notion that astronomical tables and those concerned with the astrolabe were not associated with an architectural framework.

In another late twelfth-century French manuscript, Paris, BnF, MS lat. 16208 the table is again placed to the upper left side of the folio (fig. 54). There are also a number of lines separating the different columns from each other, in a manner slightly more elaborate than that found in the other French and English examples. There are no architectural details of any sort included. Unlike the other French manuscripts however, the titles appear above the relevant columns.

One example of the table appears in MS **A** (Oxford, Bodleian Library MS Auct. F.1.9) on f. 83v, within a text which does not refer to Gerbert as the author (fig. 55). In addition to the table, two separate figures precisely illustrate parts of the astrolabe, namely the *rete*, which acts as the pointer to particular stars, with detailed lines to indicate particular measurements.²⁸⁶ The third diagram demonstrates the geometrical concepts which underline the function and appearance of the astrolabe, although this does appear in Drecker's text.²⁸⁷ In the table the locations of particular stars on the astrolabe, and the individual zodiac sign to which they belong, are identified through their height (*altitudo*) and width (*latitudo*) in the *circulus*, the

²⁸⁶ These appear on ff. 75v and 80r, respectively.

²⁸⁷ Drecker, 'Hermannus', p. 205.

latter referring to the corridor of sky through which the sun moves, or the ecliptic.²⁸⁸ These titles do not appear in Drecker's edition of the table, where there is some ambiguity as to the specific functions of the individual columns. The copyist of **A** uses an elaborate architectural framework in which to hold the information, and by doing so somewhat contradicts the thesis that this table should be presented differently to those studies in relation to geometry. However, the table in the Bodleian manuscript is an unusual example of its kind, containing elements which are not reflected in any of the other versions mentioned above.

The presence of the terms *latitudo*, and *altitudo* within an architectural framework is, as has already been shown, rather unsurprising. As we have seen, two-dimensional terms appear in texts of the quadrivium through the early and central Middle Ages. The architectural drawing, in the case of **A**, is well integrated with the textual information encoded within it. The spaces between the words in the tympanum area would indicate that the artist had planned to put arches in that position from the beginning. In the text associated with the diagram the constellations are defined as *signi*; this is not the case in the diagram, however.²⁸⁹ The third column identifies the zodiac constellations as *casae*, meaning 'home,' or 'house.' The reason for this change in terminology is not explained in the text. While the text and images would seem to be well integrated with the actual coordinates, the order in which they appear is either incorrect or unhelpfully positioned. If we compare the Bodleian manuscript to Drecker's edition, taken from an eleventh-century manuscript copy, there are a series of mistakes in the former. First, the names of the stars are incomplete in the Bodleian manuscript, where the initial letter of each has been omitted. Second, the order in which the stars appear is at odds

²⁸⁸ All of the zodiac constellations appear in a 12 degree wide area of the sky called the ecliptic, which corresponds to the sun's movement.

²⁸⁹ E.g., *prius in pagina subscripta contra quem gradum cujuscumque XII signorum eadem poni debeat*. 'In the page underneath, against which the step of the twelve signs ought to be placed in the same [place].' Drecker, 'Hermannus', p. 208. '

with Drecker's earlier version. For example, the final row in the Bodleian manuscript refers to the star *Calbalagrab*, but this star appears in the eleventh position in Drecker's edition. Furthermore, the initial insertion of this star's latitude was incorrect, where a marginal note corrects the number from XV to XXV. Mistakes in the numbering appear in several places and undermine the legitimacy of the table.²⁹⁰ These factors mean that the table as it appears in **A** should be taken as exceptional, and that other examples should be sought in order to determine visual aspects of it.

One of the most obvious differences between the table, as it appears in **A**, and the other examples above is the titles added to the top. In **A**, the copyist has used the term *casae* for the zodiac signs. This is also the only version which includes an architectural framework for the table. Two possible reasons seem the most probable. First, the copyist has included an architectural representation which reflects the use of an architectural term in the column heading. We have already seen in the studies of arithmetic, geometry, music, that there tends to be some crossover between architectural text and language in didactic diagrams. A second possible reason may be connected to the relatively large number and conspicuous nature of the architectural representations in the other parts of the manuscript. We have seen in the discussion of geometry and arithmetic that architectural representations are scattered throughout the manuscript **A**. It is possible that the artist continued the theme for the astronomical text. While this may be the case, it does not explain why other tables in the manuscript do not use an architectural framework.

In these examples there would seem to be a correlation between the text and image used to represent and refer to the tables. The tables in **A** are the only example to use an

²⁹⁰ E.g., mistakes appear in the columns for the stars Algeuze and Aldiraan. For example, two stars, *Caitozpatan* and *Caitozdeneb* are described as being in exactly the same location, testifying to the corrupt nature of the table as it appears in this particular manuscript.

architectural image of the *casae* to refer to the signs. The list of manuscripts used to contextualise this usage is not exhaustive, but it does suggest a pattern of text/image relationship which responds to the presence of architecture; the use of an architectural image may encourage use of a corresponding text; or vice-versa. Architecture was not simply added to a highly schematic table in order to make it more interesting to the medieval reader. Instead, the architectural framework plays a vital role in communicating abstract knowledge to a student who may prefer more concrete ways of learning. We have seen that one of the most common tables concerned with astronomy appears in Hermannus' work on the astrolabe. The text's subsequent association with Gerbert of Aurillac underlines its popularity as a text during the eleventh and twelfth centuries. The table, as it appears in **A**, uses an architectural framework, but it would seem that this is at odds with every other manuscript witness examined to date. It may be that the copyist of the Bodleian manuscript used the wordplay of *casae* as a catalyst to depict architecture. We have seen that in at least one case where architecture is not used this title changes to conform with the text's use of *signi* to refer to the signs of the zodiac. The evidence would suggest that the presence of architecture is used for a directed purpose within pedagogical texts, and not for mere decorative purposes.

Conclusion

Augustine writes that 'no one disputes that it is much more pleasant to learn lessons presented through imagery.'²⁹¹ Imagery offers an alternative approach to the practice of medieval learning, and architectural imagery presents an excellent example for exploration. This chapter has tried to demonstrate that architectural drawings in medieval didactic works are not merely for decoration. Instead they are an attempt to order the material under consideration, creating datasets which are literally structured in front of the reader. The architecture produced is an unashamedly two-dimensional construction, and not an attempt to recreate three dimensions, it is much more reminiscent of Hugh of Saint Victor's description of how to order and index the psalms which allows students to easily memorise and recall quantities of material. Hugh's two-dimensional structures are driven by the relation between time and space, each given a specific role within the diagram; he states that 'while [the circumstances of] time and number measure off length in the chest of memory, [the aspect of] place extends the area of width, so that the rest of the material may then be disposed in its locations.'²⁹² According to Hugh, two-dimensional grids allow for the proper ordering of material which is intended to be recalled at some stage in the future.

The methodology of this chapter has been to present particular examples of architectural representations in didactic texts. It is not possible to present every example of architectural representation that appears in twelfth-century didactic texts because there are so many of them. The manuscripts chosen for this chapter contain the clearest examples of

²⁹¹ Augustine, *Christian Teaching*, p. 33.

²⁹² Carruthers and Ziolkowski (eds.), *Anthology*, p. 40. *Siquidem in archa cordis tempus et numerus longitudinem metiuntur, aream in latitudinem expandit locus, ut deinde cetera disponantur locis suis*, Green, 'Tribus', p. 491.

architectural images combined with a reference to that image in the text. Not all examples of architectural representations in quadrivial manuscripts do this, so I have chosen the particular manuscripts because they offer much more insight into the relationship between text and image in the case of illustrated didactic works. The nature of my argument suggests that not all students required the material or kinaesthetic help architecture provided, so it stands to reason that not all manuscripts would contain such drawings. We have seen that astronomical tables could frequently contain simple grid to lists different types of information, but this stands in contrast to other examples that use architectural imagery. The choice of manuscript extends from this irregularity, and means I have included manuscripts that make relatively consistent references to the accompanying architectural drawings. This chapter has tried to identify patterns of correlation between the appearance of architectural representations in the texts of each of the quadrivial subjects, along with the language used to describe them. This frequently relies on orientating the reader through references to length and width; that is two dimensions.

The architectural nature of the quadrivial images reflects the language that underlines the purpose of the tables in the first place. This is apparent in three of the quadrivial subjects discussed above, but Hugh also alludes to it. He identifies his historical table as a vital 'foundation' upon which one could build to move toward wisdom.²⁹³ Architectural representation in didactic texts orders information, providing the first stage for the process of remembering, that is, the proper disposition of material which allows for indexing and cataloguing of the information. It is architectural, and not presented as *rotae* or *arbor*

²⁹³ *tenuerit, inveniet se fundamentum habere bonum, cui quicquid per lectionem postea superedificaverit sine difficultate et cito capiet et diu retinebit.* Ibid. 'he will find that he has built a good foundation for himself, one which he can assemble afterward anything by reading and lecture without difficulty and rapidly take it in and retain it for a long time.' Carruthers and Ziolkowski (eds.), *Anthology*, p. 39.

diagrams, because architecture relates to the language used to describe the material, and represents the ordered nature of creation.

Hugh, at the beginning of his preface to his *De tribus maximis circumstantiis gestorum*, emphasises the importance of orderliness when forming memories, and architectural representations present a structured, and ordered form to the content in two-dimensional form. He writes, 'orderly arrangement is clarity of knowledge,' and 'orderly arrangement illuminates the intelligence and secures memory.'²⁹⁴ For Hugh, ordering data encourages one's ability to remember, and the ability of architecture to divide and organise pieces of information offers a structured framework for the memory. Medieval architectural representations use different architectural elements (i.e., columns, capitals, arches, etc.) to distribute and organise information. The information is usually abbreviated in form, allowing it to be conveniently inserted into various and frequently confined spaces. This architectural framework allows for the effective presentation of a number of possible relationships between discrete packets of information. The individual architectural elements, in which the information is placed, can combine to form whole edifices, or sometimes only the elevation of a building on the page of the manuscript. The tendency to present and store information in this manner represents a significant leap in the technological level of a community or society.²⁹⁵ The symbolic storage of information within a recognisable framework allows for efficient communication of potentially sophisticated ideas over time and space. Architecture was particularly useful because it laid literal foundation for knowledge. The recognition that architectural imagery may play a vital role in communication reflects the growing concern with didactic

²⁹⁴ Carruthers and Ziolkowski, *The Medieval Craft*, p. 33.

²⁹⁵ Renfrew, 'Mind and Matter', p. 4. Renfrew, states that the fully developed cognitive sense of man has a '[T]heoretic culture using sophisticated information systems for External Symbolic Storage [...]'.

methodologies during the medieval period. How one learned was becoming as important as what one learned.

Chapter Two – Richard of Saint Victor and Three-Dimensional Architecture

Chapter one focused on architectural representations in quadrivial texts, where they act as an organisational schema for intangible data. Chapter two develops this idea of the cognitive efficacy of images, specifically by focusing on attempts to depict historical structures in three dimensions.¹ It is argued that the addition of height or depth, a third dimension, bestows the characteristic of 'reality' on imagined structures.² The so-called reality of these structures depends on the complete description of each part of the building according to contemporary rules of geometry. The structure, having been created by geometrical rules, parallels medieval concepts of the world's creation which was described using plane shapes.³ This historical reality relies on the reader's imaginative faculty to create the structures. When considering the material in this manner, the invisible world of the past is brought into the perceptible realm of the present. While this chapter incorporates discussion of imaginative structures, it will not consider the role imagined spiritual structures have in affective or meditative devotion; instead it will only be concerned with the relationship between image, knowledge, and reality.⁴ The role of architecture in devotional practice focuses on the manner in which space facilitates a person's piety, but was not thought to grant objective knowledge

¹ By 'cognitive efficacy' I do not mean the propositional requirements for the advancement of scientific knowledge, but the pedagogical faculty of image and objects more broadly. See Davis Baird, *Thing Knowledge: A Philosophy of Scientific Instruments* (Berkeley; London, 2004), p. 21.

² This third dimension is referred to as depth (*profunditas*) by some medieval authors, for example, Calcidius, *Timaeus*, p. 61.

³ Examples of 'plane shapes' are squares, circles, and two-dimensional polygons.

⁴ For their meditative or affective role see, Kathryn M. Rudy, *Virtual Pilgrimages in the Convent: Imagining Jerusalem in the late Middle Ages* (Turnhout, 2011); Beth Williamson, 'Sensory Experience in Medieval Devotion: Sound and Vision, Invisibility and Silence', *Speculum*, 88 (2013), pp. 1-43; Robert Deshman, 'Another look at the disappearing Christ: Corporeal and Spiritual Vision in Early Medieval Images', *The Art Bulletin*, 79 (1997), pp. 518-46.

about that space. For that reason it will not be considered in detail in this chapter. However, *In visionem Ezechielis* provides the clearest discussion of architectural imagery from the twelfth century, making it a highly suitable case study for this thesis.

To illustrate the use of three-dimensional images in the twelfth century we will examine Richard of Saint Victor's (d. 1173) *In visionem Ezechielis*. The text offers a detailed historical and literal commentary on the prophet Ezekiel's vision of the future Temple complex (Ez. 40-48). Richard states that the commentary is historical in focus, one which attempts to recreate the specific forms of the Temple complex Ezekiel describes. The text was accompanied by a series of highly detailed architectural drawings which illustrate parts of Richard's reconstruction. These drawings will be discussed in detail below. At first glance they appear to be highly schematic figures, the appearance of which is similar to modern technical plans and elevations. The presence of such detailed drawings is unique in twelfth-century literature, indicating that Richard's work forms a very important component in the development of architectural drawing more widely. The text and drawings of *In visionem Ezechielis* will be discussed in detail to draw out what makes the work unique, as well as to determine Richard's aims.

Reading the text and figures together, we will suggest that the aim of Richard's work is to create a verifiable and 'true' construction, one which reconstructs what the prophet Ezekiel actually 'saw.' To create this sense of reality Richard uses geometrical language to orientate and navigate the reader through the drawings. In the attempt to create a complete textual and visual reconstruction of the past Richard is forced to create architectural drawings in an *ad hoc* manner. As indicated in the introduction to this thesis, the conventions of architectural representations were not established until the thirteenth century. Nevertheless, through expert use of geometrical language, in particular the terms *figura*, *planum*, and *superficies*,

Richard meticulously recreates the entire set of structures in Ezekiel's vision, even taking into account the slope of the mountain on which the Temple stood. By interpreting the work as an act of 'worldmaking' the final part of this chapter fits *In visionem Ezechielis* into a framework which helps explain its meticulous nature. Nelson Goodman's model of worldmaking provides an effective structure for contextualising Richard's approach to using both text and image as cognitive tools, acting as a form of proof for his theories. The absolute three-dimensional quality of Richard's creation is vital to creating this sense of reality, and points towards thirteenth-century trends in a metric-based approach taken by scholars towards the universe. The final stage in Richard's work is to provide a vision of the past, one which relates to the 'simple perception of matter.' Before detailing *In visionem Ezechielis* in detail we will first outline Richard's life, and contextualise his writing.

Richard of Saint Victor and Twelfth-Century Exegesis

Richard of Saint Victor was born in Scotland or northern England at the beginning of the twelfth century.⁵ Nothing is known about his early life before he joined the canons regular at the Augustinian community of Saint Victor in Paris, at some point between 1130 and 1145. His letters indicate continuing contact with England and especially the Augustinian houses there.⁶

⁵ Jean Châtillon, 'Richard de Saint.-Victor', in Marcel Viller (ed.) *Dictionnaire de spiritualité: ascétique et mystique: doctrine et histoire* (Paris, 1937), pp. 594-654.

⁶ Gervais Dumeige, *Richard de Saint-Victor et l'idée chrétienne de l'amour* (Paris, 1952), p. 166. Also, Rodney M. Thomson, 'Monastic and Cathedral Book Production', in Nigel J. Morgan, Rodney M. Thomson (eds.), *The Cambridge History of the Book in Britain* (Cambridge, 1999), pp. 136-167, here p. 156.

The school of Saint Victor was made famous by one of its earliest masters, Hugh, who was a well-known author and teacher of the twelfth-century renaissance.⁷ Hugh died in 1141, and we cannot be certain that Richard was directly in contact with Hugh during the latter's lifetime, but the strong influence of Hugh on Richard's work has persuaded most scholars to take the view that Richard did know Hugh towards the end his life.⁸ Richard was made sub-prior in 1159, and prior in 1162, when he was given the responsibility of teaching the novices and others.⁹ Richard continued to teach and write until his death in 1173.¹⁰ He is best known for his mystical texts, *Benjamin major* and *Benjamin minor*, as well as for providing one of the fullest treatises on the Trinity from the twelfth century.¹¹

The canon house of Saint Victor was established in 1108 by William of Champeaux, who, having resigned from his post as the head of schools at Notre Dame Cathedral, wished to establish a more contemplative life. He founded the community on the left bank outside the city walls of Paris.¹² Ideally the canons located here would bridge the gap between the scholar 'who learns and teaches,' and the monk who 'prays and mourns.'¹³ Two important characteristics of the foundation would prove highly influential on Richard - the teaching ethos of the Augustinian movement, and the emphasis placed on history in Victorine exegesis.¹⁴

⁷ Hugh was referred to by contemporaries as the most important theologian of their time and as a 'second Augustine.' Quotations in Richard of Saint Victor, *On the Trinity: Richard of Saint Victor*, trans. Ruben Angelici (Cambridge, 2011), p. 4.

⁸ Significantly, Dale Coulter does not agree, stating that Richard did not arrive at St. Victor until after Hugh's death, see Dale Coulter, *Per visibilia ad invisibilia: Theological Method in Richard of St. Victor (d. 1173)* (Turnout, 2006), p. 20. Coulter states the John of Toulouse 'indicates' that Richard entered Saint Victor under the abbacy of Gilduin, and therefore could only have entered the abbey in 1145 at the earliest, four years after Hugh's death. Most other scholars state that Richard knew Hugh in person, for example see, Richard, *Trinity*, p. 5.

⁹ Dumiege, *Richard*, p. 167.

¹⁰ Châtillon, 'Richard', p. 654.

¹¹ Richard, *Trinity*, p. 5.

¹² Patrice Sicard, *Hugues de Saint-Victor et son école: Introduction, choix de texte, traduction et commentaires* (Turnhout, 1991), p. 7.

¹³ Rorem, *Hugh*, p. 6.

¹⁴ Wei, *Intellectual Culture*, p. 78. Here, Wei also discusses the 'liminal' position of St. Victor in the intellectual life of mid twelfth-century Paris.

These two factors feed into the development of *In visionem Ezechielis*. The twelfth century marked the apex of the regular canons' devotion to a broad teaching ethos, where non-members were educated in the school, along with members of the order.¹⁵ Later in the century this commitment to teaching non-members no longer stood, and fewer masters were exclusively associated with Saint Victor.¹⁶

In Visionem Ezechielis

Richard of Saint Victor is best known for his mystical texts, *Benjamin major* and *Benjamin minor*.¹⁷ His work was recognised for its focus on 'mystical theology,' and sustained connection to the intellectual programme at the Augustinian abbey of Saint Victor in Paris, a programme which 'closely align[ed] the historical narratives, things, and signs of the Scriptures with rationally ordered bodies of theological, moral, and contemplative doctrine.'¹⁸ The predominant theme in Richard's work is the exploration of the divine and the manner in which one may approach it. For Richard, and Victorines more widely, such an approach was to be founded in thorough historical knowledge, which alone provides a basis on which a mystical theology may be built.¹⁹ Indeed, the majority of Richard's primary pedagogical work, the *Liber exceptionum*, is taken up with a history of the world.²⁰ *In visionem Ezechielis'* place in Richard's

¹⁵ Ibid. Abelard describes the abbey school as a 'public school.' Abelard, *The Story of Abelard's Adversities: a Translation with Notes of the Historia Calamitatum*, trans. J.T. Muckle (Toronto, 1964), p. 16.

¹⁶ M.E. Crossnoe, 'Victorine Education, 1306-1419', *Medieval Prosopography*, 22 (2000), pp. 165-80.

¹⁷ Richard, *Trinity*, p. 5.

¹⁸ Kent Emery Jr., 'Richard of St. Victor', *A Companion to Philosophy in the Middle Ages* (Oxford, 2003), pp. 588-594, here p. 588. Despite mentioning the historical focus of some of Richard's works Emery does not reference or discuss them further.

¹⁹ Richard was not a mystic *per se*, but teaching mystic theology was a fundamental part of Victorine education in the twelfth century. Grover A. Zinn, Jr., 'Personification Allegory and Visions of Light in Richard of St Victor's Teaching on Contemplation', *University of Toronto Quarterly*, 46 (1977), pp. 190-214, here p. 191.

²⁰ Eight of ten books of the *Liber exceptionum* are concerned with figures and places of historical importance, Richard of St Victor, *Liber Exceptionum: texte critique avec introduction; notes et tables*, edited by Jean Châtillon (Paris, 1958). Richard's contribution to Peter Comestor's immensely popular work, the *Historia scholastica*, testifies to the importance of history for Richard. C.A. Robson, 'The Pecia of the Twelfth-Century Paris School', *Dominican Studies*, 2 (1949), pp. 267-279, here pp. 267-268.

corpus is rooted in this care for an extensive knowledge of historical events. In this text, Richard's only concern is for the historical circumstances and objects associated with Ezekiel's vision. At no point does Richard seek to convey a tropological or spiritual meaning to the reader, a surprising omission in light of contemporary acknowledgment of Richard's expertise in regard to 'mystical theology.' However, as Kent Emery Jr. has highlighted, the broader Victorine focus on the 'historical narratives, things, and signs of Scripture' figures prominently in *In visionem Ezechielis*.

As the title indicates Richard's *In visionem Ezechielis* focuses on the biblical book of Ezekiel, and especially on the bizarre imagery it describes, which made it difficult for medieval authors to offer a complete commentary on it.²¹ Ezekiel is one of the Bible's four Major Prophets, writing during or after the destruction of the Jerusalem Temple in the sixth century BC, and his book includes two substantial visions.²² The first appears at the beginning of the work, where the prophet describes seeing 'the likeness of four living creatures:' a man, a lion, an ox, and an eagle (Ez. 1.4-15). Ezekiel then describes an accompanying set of wheels, and 'when the living creatures went, the wheels also went together' (Ez. 1.19). The vision is accompanied by descriptions of the appearance of a crystal firmament, and the sound of wings, 'like the noise of many waters' (Ez. 1.24). The four living creatures became exegetically linked to the authors of the four Gospels of the New Testament, with Matthew as the man, Mark as the lion, Luke as the ox, and John as the eagle.²³ Ezekiel's second vision (Ez. 40-48) is an extended description of the Jerusalem Temple, and its associated buildings, and courtyards.

²¹ Jochen Schröder, *Gervasius von Canterbury, Richard von Saint-Victor und die Methodik der Bauerfassung im 12. Jahrhundert* (2 vols., Cologne, 2000). Schröder provides a parallel Latin-German text in volume 2. There are relatively few differences between this edition and that which appears in the *Patrologia Latina*. The *Patrologia Latina* edition is used to refer to Richard's work, but any changes which appear in Schröder's work will be noted. All translations of *In visionem Ezechielis* will be the author's.

²² Lawrence Boadt, 'Ezekiel, Book of', in David Noel Freedman (ed.), *The Anchor Bible Dictionary* (7 vols., New York, 1992) II., pp. 711-722, here p. 713.

²³ P. Bourguet, 'Les symboles des quatre-évangélistes', *Revue Réformée*, 10 (1959), pp. 2-25.

The first Temple, that built by Solomon, was destroyed by Babylonian forces in 586 BC, along with the city of Jerusalem.²⁴ Subsequent to this destruction the possibility of rebuilding of the Temple was uncertain, and would not occur until the time of Ezra and the Israelites' return from captivity.²⁵ The Persian emperor Cyrus the Great granted permission for the Temple to be rebuilt, but the following building campaign was unsuccessful.²⁶ Only after many years was the building reconstructed, although probably not to the same grandeur as Solomon's original structure.²⁷ Ezekiel most likely wrote his vision in the midst of the captivity of the Israelites in Babylon. The Temple was a fixed point of sanctity and a place of sacrifice for the Israelites, and its restoration must have been a primary concern, one which Ezekiel echoes in his second vision.

The prophecy and second vision begins, 'He brought me, in visions of God, to the land of Israel, and set me down upon a very high mountain, on which was a structure like a city to the south' (Ez. 40.2). The prophet meets a man with a 'brazen complexion' who guides him through a series of structures, including the Temple, constructed as it would be when the Israelites returned to their land.²⁸ This man first measures the gatehouses attached to the outermost walls of the Temple complex (Ez. 40.5-16), then the outer court with the gatehouses along its perimeter (Ez. 40.17-49). The following chapters describe the Temple itself, along with the buildings and courts adjacent to it. The measurements Ezekiel gives in these chapters are highly detailed but frequently confusing and difficult to imagine. Chapters 43 to 46 describe the priestly functions ordered by God to the different tribes of Israelites. Chapter 47

²⁴ André Parrot, *The Temple of Jerusalem* (London, 1957), p. 15.

²⁵ Ezra 1.1-4, and 4.1, also Chron. 36.22-23. The Israelite's exile is referred to the 'Babylonian Captivity,' and lasted from approximately 598BC – 520BC.

²⁶ Simon Goldhill, *The Temple of Jerusalem* (London, 2004), p. 46

²⁷ Ibid.

²⁸ Ez 40:3

describes the 'waters [which] issued out from under the threshold of the house [i.e., Temple] toward the east' (Ez. 47.1), as well as the divisions of the land allowed to the tribes, a theme which is echoed in the forty-eighth and final chapter of the book.

Medieval commentaries on the visions of Ezekiel are rare because of the difficulty associated with understanding such complicated imagery.²⁹ Richard's *In visionem Ezechielis* is unique for two reasons. First, it uses a literal and historical exegetical methodology which had not been previously attempted on these passages by a Christian author.³⁰ Indeed such an exegesis was considered impossible. Gregory the Great (d. 604) argued that interpreting the text literally in this manner was absurd, since, for example, one description of a door width in the book is wider than the wall to which it is supposedly attached.³¹ Richard overcomes such obstacles through the developed and sustained practice of literal exegesis which had developed at Saint Victor over the twelfth century, and especially in the work of Hugh of Saint Victor.

The second unique element in Richard's commentary is the presence of schematic architectural diagrams which illustrate several of the buildings described in the biblical text. There are four plans of the entire Temple complex, three of the northern gatehouse and one

²⁹ An example underlining contemporary attitudes is Abelard's purported action, as a young student, of lecturing specifically on the book as a direct challenge to Anselm of Laon. Abelard, *The Story of Abelard's Adversities*, p. 23. The two most commonly referenced texts in the *Glossa ordinaria* on Ezekiel are Saint Jerome's *Commentariorum in Ezechielem prophetam libri quatuordecim*, and Gregory the Great's, *Homiliae in Hiezechielem prophetam, Biblia Latin cum Glossa Ordinaria: Facsimile Reprint of the Editio Princeps* edited by Karlfried Froehlich and Margaret Gibson (Turnhout, 1992). The lack of commentaries up to the twelfth century demonstrates the difficulty the text presents to the exegete.

³⁰ The Jewish rabbi, Rashi (d. 1105) provided a literal commentary of the Book of Ezekiel. There are similarities between Rashi's work and Richard's, especially a highly similar map of the division of the Land between the tribes of Israel which appears in Oxford, Bodleian Library, MS Bodley 494, f. 167v. For discussion see, Lesley Smith, 'Jews and Christians Imagining the Temple', in Piet van Boxel and Sabine Arndt (eds.), *Crossing Borders: Hebrew Manuscripts as a Meeting-place of Cultures* (Oxford, 2009), pp. 99-114.

³¹ Saint Gregory the Great, *Sancti Gregorii Magni Homiliae in Hiezechielem Prophetam*, CCSL 142 (Turnhout, 1971), p. 209.

of the Temple itself (figs. 56-63).³² Additionally there are frontal and lateral elevations of the northern gatehouse (figs. 64 and 65) and one lateral elevation of the building just north of the Temple (fig. 66). There is an image representing the altar placed at the centre of the complex (fig. 67), and a schematic of a circle and triangle indicating the slope of the mountain on which the entire complex is placed (fig. 68). The diagrams are usually large, taking up entire pages, and are often coloured; most importantly, although not present in all manuscripts of the work, they are common and consistent enough for us to judge that they were intended to complement the text from its inception.³³ Set in context, Richard's diagrams are a highly sophisticated conceptualisation of space, and are much more developed than earlier architectural drawings. This chapter will focus on the plans and elevations for the gatehouse because these combine to form the most complete depiction of a particular structure in the text. This is not to imply that the other drawings are not worthy of analysis, only that space in this chapter does not allow for a considered discussion of the other drawings.

Richard was not the first to attempt a historical or literal commentary on the book of Ezekiel, nor even the first to include architectural drawings with such a commentary. Literal exegesis attempts to explicate Scripture in terms of its historical and textual aspects. By the beginning of the twelfth century there were a number of attempts to provide a historical commentary on Ezekiel's architectural description by Jewish authors. The most significant commentary was written by the French Rabbi Solomon b. Isaac, commonly known as Rashi (d.

³² Richard refers to a large plan associated with chapter 12 of *In visionem Ezechielis*, which is not transmitted in all manuscript witnesses. It has recently been rediscovered, and can be found in Delano-Smith, 'The Exegetical Jerusalem', pp. 41-76.

³³ The images' appearances are faithfully transmitted, for the most part, from copy to copy; Ibid., p. 45. There is some question over the number of manuscript witnesses, Catherine Delano-Smith identifies twenty-two complete copies, in contrast to Rudolf Goy who enumerates twenty-four, however, two are only fragments. See Ibid., 45, and also, Rudolf Goy, *Die Handschriftliche Überlieferung der Werke Richards von St. Viktor im Mittelalter* (2 vols., Turnout, 2005), II, p. 78.

1105).³⁴ Rashi included a plan of Ezekiel's description which has been recently rediscovered by Jordan Penkower. The plan is diagrammatic in style – that is, without decoration or additional details – and illustrates two courtyards with gatehouses on three sides.³⁵ The work is annotated in Hebrew and indicates the various parts of the complex. Richard's contemporaries, Hugh and Andrew of Saint Victor were heavily influenced by contemporary Jewish exegetical methods, and it would seem plausible that Richard was also aware of Jewish attempts to provide a literal commentary on the Bible.³⁶ Compared to Rashi's drawing, Richard's compilation of plan and elevation offers a much more complete reconstruction of Ezekiel's vision, and certainly represents a development in architectural representation.

In visionem Ezechielis does not have a modern critical edition, and so aside from where indicated, here I use Oxford, Bodleian Library, MS Bodley 494 as its main manuscript witness to the text and images. The earliest witness to the text appears in Paris, Bibliothèque National de France, MS lat. 14516, which may have even been completed under Richard's supervision at St. Victor close to the time of his death.³⁷ However, Bodl. 494 represents an excellent early copy, especially when complemented by Oxford, Bodleian Library, MS e Museo 62. This is an early thirteenth-century Cistercian manuscript completed at Kingswood abbey in Gloucestershire. It contains a note by the corrector of *In visionem Ezechielis*, stating that it was

³⁴ For more information about Rashi and his connection with contemporary Christian exegesis, H. Hailperin, *Rashi and the Christian Scholars* (Pittsburgh, 1963).

³⁵ A reproduction of the image can be found in Menachem Cohen (ed.), *Mikra'ot Gedolot Ha-Keter*, 14 vols (Ramat Gan, 2000), vol. V/2., p. 322. Thanks are due to Catherine Delano-Smith and Jordan S. Penkower for their help sourcing this image.

³⁶ A schematic plan of the division of the Holy Land between the tribes of Israel appears after the text of *In visionem Ezechielis* in Bodley 494. The image is highly reminiscent of a Jewish image by the well-known Jewish medieval scholar Maimonides (d. 1204). The connections between the two is discussed in Lesley Smith, 'Jews and Christians Imagining the Temple', in Piet van Boxel and Sabine Arndt (eds.), *Crossing Borders: Hebrew Manuscripts as a Meeting-Place of Cultures* (Oxford: Bodleian Library, 2009), pp. 99-114. For more information on Andrew of St. Victor and the influence of Hebraic thought: G. Hadfield, 'Andrew of Saint Victor, A Twelfth-Century Hebraist. An Investigation of his Works and Sources' (DPhil thesis, University of Oxford, 1971).

³⁷ Walter Cahn, 'Architectural Draftsmanship in Twelfth-Century Paris: The Illustrations of Richard of Saint-Victor's Commentary on Ezekiel's Temple Vision', *Gesta*, 15 (1976), pp. 247-254.

not corrected 'except by comparison with two faulty exemplars.'³⁸ Walter Cahn's work established the earliest known copy of the text, but Jochen Schröder has modified Cahn's conclusion by arguing that there were two variant versions of the text circulating after Richard's death, although he was not able to describe the textual transmission of the work completely.³⁹ Delano-Smith speculates that MS e Museo 62 contains elements of the second recension which Schröder claims existed, because none of the corrected portions are found in the PL version, which is based on BnF, lat. 14516.

A number of modern scholars have considered Richard's *In visionem Ezechieis* and its drawings. Walter Cahn's two papers on the subject were the first to examine the drawings and their context in detail, but he underestimates the problematic nature of Richard's images because Cahn attempts to explain the appearance of the drawings as if they were modelled after contemporary buildings. For example, Cahn makes comparisons between a fortification at Pouilly-le-Fort and Richard's drawings for the northern gatehouse, based on Richard's own general allusions.⁴⁰ However, there is no reason to suspect that Richard ever had a particular structure or structures in mind. The comparisons Cahn makes between specific structures, such as the crenellations on St. Denis's west facade and those that appear on Richard's gatehouses, are not helpful because there is no contextual evidence linking Richard's literal

³⁸ Oxford, Bodleian Library, MS e Museo 62, f. 75r; also, Delano-Smith, 'Exegetical Jerusalem', pp. 51-52.

³⁹ Schröder, *Gervasius von Canterbury*, pp. 159-172.

⁴⁰ Walter Cahn, 'Architecture and Exegesis: Richard of St.-Victor's Ezekiel Commentary and Its Illustrations,' *The Art Bulletin*, 76 (1994), pp. 53-68, here p. 61. Cahn also writes, in relation to the Golden Gate structure in Jerusalem, 'Its appearance today is due to the reconstruction of Jerusalem's walls under the Ottomans, but excavations have uncovered earlier substructures and made it feasible to determine the original plan in an approximate way. Richard's discretion, however, forbids anything other than speculation on this possible stimulus to his thought.' *Ibid.*, p. 63. This statement clearly implies that Cahn thinks comparisons may be drawn between the actual structure of the Golden Gate, as it existed in the twelfth century, and Richard's drawings for the northern gate. Such comparisons are unlikely to yield any significant results because Richard would have needed to have seen the structure, for which we have no evidence, or would have needed a clear report of the structure's appearance. Cahn misses the point behind Richard's inclusion of the diagrams. As we will see, Richard's architectural description is unique because of its focus on accuracy of representation, a facet of the drawings which must be considered in any full discussion of them.

description of Ezekiel's vision with the architectural elements of St. Denis.⁴¹ Indeed, crenellations regularly appear on a variety of twelfth-century architectural representations, meaning they were a normal part of the contemporary artist's repertoire for depicting buildings and cities.⁴² It may be more profitable to locate Richard's work in earlier and contemporary monastic discussion of architecture and geometry, taking in to account the language Richard himself uses, and not to rely on comparisons between particular architectural elements in one drawing and a corresponding element in the physical world.

Architecture, and architectural depictions in particular, have received attention from scholars studying aspects of medieval memory and mnemonic techniques. Mary Carruthers' studies of the subject expand on Frances Yates' work.⁴³ According to this view, techniques used for improving recall, as well as developing inspiration from remembered items, stem from antiquity, and are transmitted particularly in the pseudo-Ciceronian *Rhetorica ad Herennium*.⁴⁴ This text was known during the Middle Ages, and provided an outline for rhetorical education, including the memorisation of texts and ideas with a view to using them in the creation of new texts. Aspects and elements from a speech or memorised text were envisioned as an object and placed against an architectural backdrop. This backdrop formed part of a larger structure, which allowed the subject to recall the order in which the elements came. When the subject wished to remember the original work they would imagine themselves walking through the same architectural structure, and be reminded of the work or text based on the images which

⁴¹ Cahn, 'Architectural Draftsmanship', p. 251. It is not St. Denis' crenellations which marked the abbey church out as especially important.

⁴² For example, Dijon, Bibliothèque Municipale, MS. 14, f. 13r which depicts King David sitting in the centre of city walls; The Heavenly Jerusalem in the *Liber floridus*, Wolfenbüttel, Braunschweigische Landesbibliothek, MS. Gud. Lat. I, f. 43v. They also appear in the waterworks drawing in the Eadwine Psalter, which will be discussed in detail in the following chapter. Christopher Wilson speculates that the St. Denis' crenellations may be a deliberate attempt to evoke the heavenly Jerusalem, see Wilson, *Gothic Architecture*, p.34.

⁴³ Carruthers, Ziolkowski, *The Medieval Craft*; Mary Carruthers, *Craft*; eadem, *Book of Memory*; eadem, (ed.), *Rhetoric Beyond Words: Delight and Persuasion in the Arts of the Middle Ages* (Cambridge, 2010).

⁴⁴ Pseudo-Cicero, *Ad C. Herennium: De rationi dicendi*, trans. Harry Caplan (Cambridge, Mass., 1954).

they had originally placed there.⁴⁵ Carruthers differentiates between advice given to students in the classical texts and the reality of monastic practice during the Middle Ages. The former encouraged the student to use buildings 'such as his own house, which he would revisit frequently.' This allowed for a firm recollection of the architectural backdrops.⁴⁶ Medieval practice was 'to construct a wholly fictional building,' allowing for a variety of structures.⁴⁷

Carruthers' argument has the advantage of explaining the appearance of some aspects of the drawings as they appear in *In visionem Ezechielis*. For example, many of Richard's drawings assume a Romanesque style for the architecture, and are clearly influenced by contemporary styles. However, while Richard's work appears in the context of medieval architecturally derived mnemonics, placed there by Carruthers, it is not entirely clear what role Carruthers sees Richard's drawings playing in this context.⁴⁸ Her most extended discussion contrasts the drawings with Adam of Dryburgh's (d. 1212) entirely textual description of the tabernacle. Carruthers emphasises the literal nature of Richard's work which is aided by the inclusion of drawings. These '*picturae*' may act as a catalyst to the mental or imaginary constructions of mnemonic buildings, but they are somehow different from Adam's work.⁴⁹ She writes that Richard's commentary 'is the equivalent of part one of Adam of Dryburgh's *De tripartito tabernaculo*, a literal exegesis that is distinguished from what is called a picture.'⁵⁰ This equivalence drawn between Richard's and the first part of Adam's works does not explain why Richard would include drawings or physical *picturae*.⁵¹ Indeed it problematizes Richard's

⁴⁵ Ibid., p. 209.

⁴⁶ Carruthers, *Craft*, p. 239.

⁴⁷ Ibid., p. 238.

⁴⁸ The jacket illustration of *The Craft of Thought* reprints the frontal elevation of the northern gatehouse from MS. Bodl. 494, f. 155v and would indicate that Carruthers sees a strong link between Richard's work and the mnemonic framework she expertly describes.

⁴⁹ Carruthers, *Craft*, p. 250. Richard never uses the term *pictura* to describe his drawings.

⁵⁰ Ibid. Italics are original.

⁵¹ At no point does Richard refer to the accompanying images as *picturae*. Richard's language is discussed in detail below.

work in this regard, begging the question what it is about Richard's endeavour in particular that encourages him to include images. It also does not explain Richard's concern for accuracy of representation in details such as the flat roof which follows the style of that in the Holy Land.⁵² Furthermore, Richard's text shows only minimal concern for the reader to remember the structures and images discussed. Instead Richard states that the drawings are included to help the reader 'understand' his reconstruction.⁵³

Carruthers expresses the problems of Richard's text and images elegantly when questioning the 'reality' of the literal description. This is an important point when determining what it means for Richard's drawings and commentary to be seen as 'real.' While commenting on Richard's drawings, and the Victorine tendency to convey information and historical circumstance visually, Carruthers, responding to Beryl Smalley's claim that at St. Victor during the twelfth century 'a scientific movement is really afoot,'⁵⁴ writes,

But what was at issue, I think, was not whether or not to visualize the words [...], rather what sort of 'reality' the visionary building should be understood to have, whether it was a wholly 'cognitive picture,' or was also a picture 'of' a factual 'object.'⁵⁵

It may be argued that Carruthers' binary choice between 'cognitive picture' or 'factual object,' is not a mutually exclusive one, and that Smalley's identification of a scientific movement at Saint Victor is certainly correct, but may be offered more sophistication in light of Carruthers'

⁵² *forte secundum morem terrae Palaestinarum debemus intelligere tectum portae planum esse, non erectum*, PL 192: 554D, 'according to habit in the land of the Palestinians we ought to understand the roof of the gatehouse to be flat and not elevated.'

⁵³ For example, *omnium quae superius per partes prolata sunt formam in unam figuram colligere, ut intuentis animus eorum omnium locum, situm et numerum, qualitatem, quantitatem, proportionem facile possit ex ejus contemplatione colligere*, PL 192: 549A-550A, 'The upper parts of everything were mentioned to collect in an image in one figure, so by looking at all these things in one place one is easily able to put together the place, the site, its measurements, type, size and proportion from its contemplation.'

⁵⁴ Beryl Smalley, *The Study of the Bible in the Middle Ages*, 2nd ed (Notre Dame, 1978), p. 86-87.

⁵⁵ Carruthers, *Craft*, p. 184.

question regarding the 'reality' of Richard's images.⁵⁶ Carruthers highlights the ambiguous nature of the term 'reality' in this sense, especially in a monastic setting which, she argues, privileges the imaginative powers. However, by investigating the underlying medieval assumptions regarding architectural 'reality' it may be possible to shed more light on Richard's work. In the process of doing so it will become clear that the scientific nature of Richard's work suggests that it is not necessarily a cognitive tool, but a 'real' and verifiable recreation of the historical past, one which takes advantage of contemporary uses of three-dimensional measurements. Carruthers alludes to the nature of this reality when quoting Peter of Celle's *Liber de panibus*, where he writes about an allegorical monastery, 'The chest of Jesus is there, the refectory; the breast of Jesus is there, the dormitory; the face of Jesus is there, the oratory; the width, breadth, height and depth of Jesus is there.'⁵⁷ In this architectural metaphor Peter mentions the three dimensions of Christ, appearing as a shorthand to refer to the visible, tangible and, in this case, real appearance of Christ. The description makes use of this scientific and three-dimensional reality as a means to describe a cognitive tool, and the width, length, and height (i.e., the three dimensions) can be seen as a means through which Richard communicates that reality.

Historical Exegesis and Saint Victor, Paris

Hugh of Saint Victor states that history is the 'foundation' of knowledge, providing the support for allegorical and tropological interpretations of Scripture, and this emphasis on historical exegesis was one important element in Richard's development of *In visionem Ezechielis*. For

⁵⁶ Carruthers' astute appraisal of Victorine exegetical commentaries in a general sense does not mitigate against the aforementioned problems of her assessment of Richard's *In visionem Ezechielis* in particular.

⁵⁷ Ibid., p. 238.

Richard, and the Victorine authors more broadly, the literal and historical exegesis of Scripture forms the core part of any commentary.⁵⁸ One motivating factor for Richard when writing *In visionem Ezechielis* is to provide a firm foundation for further exploration. In the prologue Richard writes: '*Et tunc, ut eis videtur, spiritualis intelligentiae structura firmitus statuitur quando in historici sensus solido apte fundatur.*'⁵⁹ Richard's insistence on the importance of history in exegetical commentary is a rebuttal of previous Christian authors who dismissed the possibility of providing a historical commentary on Ezekiel's visions of the Temple complex. In particular Richard must be responding to Gregory the Great's argument that it simply was not possible to provide a historical account of Ezekiel's vision, because the language and numbers Ezekiel used to describe the buildings did not lend themselves to such an interpretation.⁶⁰ In essence, Richard's attempt to provide an historical exegetical commentary by focusing on the literal qualities of Scripture is a reaction to previous rebuttals against such an approach.

As a result of the Victorine emphasis on historical reality, the canons developed a methodological approach which enabled students to interpret Scripture as an historical, and therefore 'real,' event. Historical exegesis at Saint Victor was a particular *disciplina* which

⁵⁸ Mary A. Mayeski, 'Early Medieval Exegesis: Gregory I to the Twelfth Century', in Alan Hauser and Duane F. Watson (eds.), *A History of Biblical Interpretation: Vol. 2, The Medieval Through the Reformation Periods* (2 vols., Grand Rapids, Mich.; Cambridge, 2009), II., p. 87.

⁵⁹ 'Then, as it is seen in these things, the structure of the spiritual sense is more firmly established when it is properly founded in the historical sense with strength.' PL 196: 527B. Richard makes similar statements elsewhere in his writing, for example, '*In Scriptura sacra primum locum tenet historia*', 'History holds the first place in sacred Scripture.' *Benjamin minor* PL 196:199D.

⁶⁰ *Quibus uerbis quid aperte indicat, nisi quia nihil de ciuitate quam uiderat iuxta litteram dicat? Nam spiritaliter de ea loquitur quam spiritaliter contemplatur.* Gregory the Great, *Homiliae in Hiezechielem Prophetam*, CCSL 142 (Turnhout, 1971), II.1.3., p. 209. Richard makes a direct attack on those who criticised his work, writing, *Sed nec illud tacite praetereo, quod quidam quasi ob reverentiam Patrum nolunt ab illis omitta attentare, ne videantur aliquid ultra majores praesumere. Sed inertiae suae ejusmodi velamen habentes, otio torpent et aliorum industriam in veritatis investigatione et inventione derident, subsannant, exsufflant. Sed qui habitat in coelis iridebit eos, et Dominus subsannabit eos.* 'But I will not pass by them [Richard's critics] silently, from their negligence they refuse to argue further, supposedly on account of reverence for the fathers, so that they are seen not to presume to go beyond previous great men. They struck motionless in leisure and mock, ridicule and deride the work of other investigations and missions of truth. But he in heaven (in return) will ridicule them and the Lord shall mock them.' PL 196: 527C-D.

presented the historical reality to the reader and exegete.⁶¹ Hugh of Saint Victor identified the trivium as apposite to discovering the historical reality which underpins Scripture.⁶² Victorine historical exegesis focuses on the *sensus litteralis* of Scripture, which may be understood as the 'plain' or 'simple' meaning.⁶³ There are several ways in which the exegete explained facets of Scripture, but Richard's primary method in *In visionem Ezechielis* was to 'explicate individual words in a verse with the goal of helping the reader understand how they function within that particular book.'⁶⁴ Examples of this are found in Richard's attempts to explain contradictions in the text by means of determining the author's intention by using particular words, such as *porta*. He writes,

*Nomine enim portae aliquando designamus ipsum ostium quod aperitur et clauditur. Aliquando ipsum hiatus seu aditum per quem transitur. Aliquando ipsum ambitum quo hiatus ipse cingitur, ea videlicet pars muri quae ostium amplectitur, et reliquo parieti in materia vel forma ornatus causa dissimilis et supereminens cernitur.*⁶⁵

This emphasis on explaining individual words shows that a fundamental tool in Richard's application of the historical *disciplina* derives from the particular Victorine use of the trivium (i.e., grammar).

This particularly Victorine model begun by Hugh, and reiterated by Richard in his *Liber*

⁶¹ Jan Wolter Marius van Zwieten, *The Place and Significance of Literal Exegesis in Hugh of St Victor* (Amsterdam, 1992), p. 10.

⁶² Coulter, *Per visibilia*, pp. 69-70.

⁶³ Michael A. Signer, 'Peshat, *Sensus Litteralis*, and Sequential Narrative: Jewish Exegesis and the School of St. Victor in the Twelfth Century', *Jewish History*, 6 (1992-93), pp. 203-216, here p. 204. Contemporary Jewish exegetes were known to emphasise the importance of the literal sense (*peshat*) of Scripture in the eleventh and twelfth centuries, see, Sara Japhet, 'Exegesis and Polemic in Rashbam's Commentary on the Song of Songs', in Natalie B. Dohrmann and David Stern (eds.), *Jewish Biblical Interpretation and Cultural Exchange: Comparative Exegesis in Context* (Philadelphia, 2008), pp. 183-195.

⁶⁴ Signer, 'Peshat', p. 208.

⁶⁵ 'For another [object] by the name for a portal we may sometimes assign an opening which opens and closes. One is the *hiatum* or an entrance which is crossed. Another is the *ambitum*, which the *hiatus* is surrounded by, it is the part of the wall which goes around the opening, it is distinguished and decorated by objects or by [its] form so to highlight or emphasise it from the remaining wall.' PL 196: 580D-581A

exceptionum 'was able to establish a relationship between the ancient knowledge of the *artes liberales* [sic] with the modern knowledge of the *artes mechanice*.⁶⁶ Richard was clearly aware of developments in geometric practice carried out by Hugh, indicated by his reiteration of geometry's purpose in his *Liber exceptionum*, which is taken from Hugh's *Practica geometria*.⁶⁷ In Hugh's *Didascalicon* the *artes mechanicae* included knowledge of architecture, a subject which was previously included in the liberal arts subjects.⁶⁸ Richard's innovation when creating *In visionem Ezechielis* is not that he inserts the quadrivium, and geometry in particular, into his commentary, but that he uses it to discover 'truth'.⁶⁹ Michael Signer noted that Richard's stated aim in writing *In visionem Ezechielis* was to find 'truth'.⁷⁰ Richard writes, '*Sed inertiae suae ejusmodi velamen habentes, otio torpent et aliorum industriam in veritatis investigatione et inventionem derident*'.⁷¹ Richard's writing of his commentary should then include elements which are verifiable and eminently true. In order to do so he incorporates aspects of the quadrivium, and geometry in particular. The mechanical arts, for Richard, are able to link the trivium and his goal to provide truth, beyond reliance on the authority of the church fathers.⁷² For Richard, 'we must start from the created world in order to gain certainty',⁷³ and certainty

⁶⁶ R. Berndt, 'The School of St. Victor in Paris', in Magne Saebø (ed.), *Hebrew Bible/Old Testament: The History of its Interpretation* (2 vols., Göttingen, 2000), I, pp. 467-495, here p. 492. Also, Peter Sternagel, *Die artes mechanicae im Mittelalter: Begriffs- und Bedeutungsgeschichte bis zum Ende des 13. Jahrhunderts* (Münich, 1966.).

⁶⁷ Hugh describes geometry as '*Huic practice tria videntur genera attributa, hoc est altimetria, planimetria, cosmimetria, in quibus tamen omnibus maxime linearum dimensionem vestigat*,' Hugh of Saint Victor, *Hugonis de Sancto Victore Opere Propaedeutica: Practica geometriae, De grammatica, Epitome Dindimi in philosophicum* edited by Roger Baron (Notre Dame, Ind., 1966), p. 17. Compare this with Richard's description, '*Geometria tres habet species: planimetriam, altimetriam, cosmimetriam*.' Richard, *Liber Exceptionum*, I. xi, p. 108.

⁶⁸ As noted in the first chapter, p. 52.

⁶⁹ Coulter, *Per visibilia*, p. 70.

⁷⁰ Signer, '*Peshat*', p. 209. Signer links this stated aim of 'truth' with a similar desire in contemporary Jewish exegesis.

⁷¹ "But, having a veil of their ignorance, they are numb with laziness and deride the industry of others in the investigation and discovery of truth." PL 172: 527C.

⁷² Wei, *Intellectual*, p. 39.

⁷³ Nico den Bok, *Communicating the Most High: A Systematic Study of Person and Trinity in the Theology of Richard of St. Victor* (Turnhout, 1996), p. 172.

can be derived from the contemporary environment, which is constructed by knowledge of the *artes mechanicae*. By incorporating images and three-dimensional descriptions of a building Richard evokes his built environment, a technique in line with contemporary Victorine exegetical methods.

Hugh of Saint Victor's *Mystic Ark*

Although Richard's approach of synthesising text and image to form a three-dimensional model of history in *In visionem Ezechielis* is unique, a similar *approach* was taken by Hugh of Saint Victor in another context. Around 1120 Hugh of Saint Victor developed a pedagogical image for use as the focal point of a series of lectures. The lectures which accompanied the image are collected in two texts called *The Mystic Ark* and *The Moral Ark*, which take Noah's Ark as an exegetical image and offer one of the clearest influences on Richard's combination of text and diagram in his *In visionem Ezechielis*.

The Mystic Ark begins by Hugh asking the reader to draw a square with the *Agnus Dei* placed in the centre, with *alpha* and *omega* characters accompanying it.⁷⁴ This square forms the top of Noah's Ark, the primary subject of the drawing; it is accompanied by an *imago mundi*, and a *maiestas* figure which envelopes the Ark. In this text there is little discussion of the semantic or allegorical qualities of the figures and objects Hugh instructs his readers to draw. The purpose of the drawing is to organise and communicate Hugh's systematic theology. Hugh attempts to achieve this by identifying four Arks within a single image. These Arks are The Ark of Noah, The Ark of the Church, The Ark of Wisdom, and The Ark of Mother Grace, which correspond to the levels of literal/historical, simple allegorical, anagogical, and

⁷⁴ 'First, I find the center point on the surface where I wish to depict the Ark, and there – the point having been fixed – I draw a small square.' Rudolph, *Mystic*, p. 397.

tropological, respectively.⁷⁵ The second text, titled *The Moral Ark*, discusses the allegorical and anagogical content of the image Hugh describes, which may have taken the form of a talk or series of lectures to the students of Saint Victor.⁷⁶ Despite Hugh's detailed description of the drawing it is unclear whether the image which Hugh describes in *The Mystic Ark* existed physically or if it describes an imaginary construction, that is, one he wanted each reader/listener to construct in his mind alone. Conrad Rudolph speculates that the immense size of the drawing meant that it took the form of a painted wall either in the cloister or chapter house at Saint Victor.⁷⁷ In contrast to this, Mary Carruthers believes that the drawing was only a cognitive image, and there was no need for it to be drawn in any way. Since there are no extant copies of the image nor fragments of it, we must rely on a close reading of *The Mystic Ark* to recreate Hugh's original work.⁷⁸ If Rudolph's theory that the image was a wallpainting is correct, Richard must have known it, and indeed must have been familiar with both its appearance and the teachings associated with it.⁷⁹ There are relatively many manuscripts containing both or one of Hugh's works, indicating that they, and presumably some versions of the image, were known throughout medieval Europe.⁸⁰ Both of the works concerning the Ark describe a highly complicated and sophisticated image with an immense amount of content which Hugh sorts systematically.⁸¹

⁷⁵ Ibid., p. 20.

⁷⁶ Ibid., pp. 1-2. *The Moral Ark* begins with Hugh's description of his lecture to the canons of Saint Victor.

⁷⁷ Rudolph, *First*, pp. 73-74.

⁷⁸ Mary Carruthers argues that the image never physically existed and would have been interpreted by contemporaries as describing an imaginary structure, Carruthers, *Book of Memory*, p. 303; also, Mary Carruthers, 'The Poet as Master Builder: Composition and Locational Memory in the Middle Ages', *New Literary History*, 24 (1993), pp. 881-904. Conrad Rudolph strongly disagrees with this stance, arguing that the image was 'to be explained and to be discussed in the cloister', Rudolph, *Mystic*, p. 16. Rudolph goes as far as supplying a mocked-up image of what the Ark image would have looked like when set in the cloister, Ibid., p. 33.

⁷⁹ Rudolph is at pains to underline the persistent legacy of the painting and the lectures, especially in St. Victor.

⁸⁰ Sicard gives a list comprising 179 manuscripts which contains one or both *The Mystic* and *Moral Ark*. Hugh of Saint Victor, *De Archa Noe, Libellus de Formatione Arche*, edited by Patrice Sicard, CCCM 176 (Turnhout, 2001), pp. 29-69.

⁸¹ Systemic theology forms part of Hugh's impetus to write *The Mystic Ark*, see Rudolph, *Mystic*, pp. 60-61

The relationship between Hugh's Ark and Richard's drawings are, first, the use of a plan (i.e., an image which illustrates a building or structure directly from above); second, the possible inclusion of such a drawing to illustrate the historical appearance of a structure; and third, the vocabulary used to discuss these drawings. The third point will be discussed in detail in relation to broader analysis of Richard's language and vocabulary. Concerning the first point; that is, the presentation or description of a structure's ground-plan, while there are no extant images of the Hugh's intended image, the description of the drawing is sufficiently clear for a reconstruction to be made. Conrad Rudolph has recently provided the most complete recreation of the plan.⁸² Rudolph's image takes into account the broadest available evidence, and includes the colours which Hugh describes as an important part of reading the ark.⁸³ From Rudolph's reconstruction it is clear that Hugh attempted to depict the ark as if seen from above, in a very similar manner to Richard's drawings.⁸⁴ Hugh's first chapter describes the cubit at the apex of the Ark, but it is depicted as a square, as if from above. The first four figures of *In visionem Ezechielis* (figs. 56 - 59) depict part of the complex from above, with the different elements coloured to aid the reading of the diagram. There is significantly less detail in Richard's image when compared to Hugh's description; however both represent the structures from above. Both Hugh and Richard also use similar language to refer to the images, namely referring to drawing of the Ark as a *planum*.⁸⁵

Hugh's concern is to demonstrate the relationship between the three senses of

⁸² Rudolph, *Mystic*, p. 2.

⁸³ Rudolph includes a discussion of previous attempts to recreate Hugh's plan of the Ark. The most important previous attempt appears in the second volume of Hugh of Saint Victor, *Hugonis de Sancto Victore De Archa Noe; Libellus de Formatione Arche*, edited by Patrice Sicard (2 vols., Turnhout, 2001).

⁸⁴ Rudolph, *Mystic*, I.I., pp. 397-398. Conrad's reconstruction of Hugh's Ark is laid out in a plan format, as is Sicard's.

⁸⁵ For example, *Et haec est causa, quare in plano bis altitudinem depinximus, quoniam oportebat utriusque lateris superficiem repraesentari*, PL 176: 684B, 'And this is the reason, whereby we draw twice the height in the plan, because it may be able to represent the surface of each wall.' Richard's usage of the terms *planum* and *superficies* is examined below.

Scripture: historical, allegorical, and tropological.⁸⁶ Both Hugh and Richard are concerned with depicting a set of physical and historical structures, reconstructed for the sake of the reader. Hugh's image is much more ambitious in its attempt to portray several meanings simultaneously. However, Rudolph highlights Hugh's lack of consistency in the creation of the historical Ark, where elements are added to it which may not have a scriptural basis.⁸⁷ The reason is that while Hugh wishes to create a historically sound structure, his primary concern is to communicate the allegorical and tropological meanings of the Ark image. Richard's concern is solely historical, so much so that in the fourteenth century Nicholas of Lyra criticised Richard's focus on the historical description of the Temple and its surrounding buildings.

If Hugh's image existed in visible form, and not simply as an imaginative catalyst for devotional purposes, he envisioned the Ark to be represented as a plan, thus linking his intention with Richard's later diagrams. While Richard only provides a commentary on the historical appearance of Ezekiel's vision, it is clear that the combination of text and schematic image made an impression on him, because it is exactly these characteristics he uses to great effect in *In visionem Ezechielis*. The formation of both Hugh's and Richard's work relies on geometry, the detailed enumeration of shapes using straight-edges and accurate measurements.⁸⁸

Geometrical Text

The language Richard uses to refer to and to describe the diagrams in *In visionem Ezechielis*

⁸⁶ *et unusquisque librorum exterius tribus gradibus distinguitur, propter triplicem intelligentiam, id est historiam, allegoriam, tropologiam*, PL 176: 693A, 'Each of the books distinguishes between the three exterior steps, according to the triple understanding, that is history, allegory, and tropology.'

⁸⁷ Rudolph, *Mystic*, p. 76.

⁸⁸ Michael A. Signer, "Vision and History: Nicholas of Lyra on the Prophet Ezekiel," in Philip D.W. Krey and Lesley Smith (ed.), *Nicholas of Lyra: The Senses of Scripture* (Leiden, 2000), pp. 147-171, here p. 169.

link the work with Hugh of Saint Victor's lectures on the Ark, and by focusing on this language it is possible to gain deeper insight into Richard's intentions for these diagrams. Richard uses the terms *figura* and *planam* but it is unclear what exactly he means by them. We can get some idea of Richard's intentions by considering the history of the usage of these terms up to the twelfth century. In this section I propose that Richard's use of some terminology is influenced by wider developments in contemporary geometry, a discipline which identified and also used images in ways similar to Richard. As we have seen, it is not unusual for medieval authors to refer to an accompanying drawing as *figura*, whether it is architectural or not; however, it is unusual to see them closely associated with the terms *planum* and *superficie*. Richard uses both these terms in a manner which strongly resembles their use in geometrical texts.

For the most part, Richard refers to his plans and elevations as *figura*, *forma*, or *exemplar*. For example, when discussing the half-plan of the northern gatehouse on fol. 137v (fig. 61), Richard writes, *omnium quae superius per partes prolata sunt formam in unam figuram colligere*.⁸⁹ At the beginning of chapter twelve, in reference to a large plan of the buildings, Richard writes, *sicut ex supra positis figuris oculis subjectum patet*.⁹⁰ The smaller plans at the beginning of the treatise tend to be termed *forma*. For example, he writes, *horum igitur quae jam descripsimus formam taliter repraesentamus* (fig. 57), and *horum itaque quae jam descripsimus formam huiusmodi repraesentamus* (fig. 58).⁹¹ Richard also uses the term *exemplar* on two occasions. The first, in chapter three, concerns a small plan of the entire complex with the gatehouses (fig. 59). The second occurrence appears in chapter twelve, just after the previous example of *figura*; *magna figura, sicut ibi videri potest, formam et exemplar*

⁸⁹ 'The upper parts of everything were mentioned to collect in an image in one figure.' PL 196: 549A.

⁹⁰ 'Similarly, the subject is clear from that depicted above, by means of the figure for the eyes.' Ibid., 565C.

⁹¹ 'Thus, those [parts] of them we already described, we represent the form in this manner.' Ibid., 538A

latius expressimus.⁹² It is difficult to draw conclusions from this set of examples; however, it would seem that Richard refers to drawings which convey large areas of land as *exemplar*, usage which derives from Hugh of Saint Victor, and possibly even earlier.⁹³ For now, I will assess Richard's use of the term *figura* and its association with the term *planum*, then discussion will move to a brief description of *exemplar*.

Erich Auerbach described the usage of the term *figura* from the first century B.C. to the Middle Ages, detailing the manner in which authors adapted its use for particular contexts.⁹⁴ Auerbach focuses on figural interpretations of text in the Middle Ages, as well as typological links made between the Old and New Testaments.⁹⁵ There are two primary strands of the word's usage in relation to the current discussion. The first concerns the use of *figura* in quadrivial or practical texts; the second concerns the theological implications of the word and the manner it was used to refer to the past and future. In an architectural context, Auerbach refers to Vitruvius' description of the ground-plan stating that in antiquity the plan drawing could be termed a *figura*.⁹⁶ In fact, Vitruvius specifically refers to the elevation drawing, termed *orthographia*, as a *figura*, or an image which represents a part or the entirety of the intended structure.⁹⁷ It seems unlikely that *figura* would refer only to an elevation drawing, and hence

⁹² 'With the large figure, which is able to be seen here, we have expressed the form, and the model for the wall.' Ibid., 566C.

⁹³ Hugh of Saint Victor's text *The Mystic Ark*, describes how the medieval student draws a large image of Noah's Ark which could be used to learn about the historical, allegorical, and tropological meanings of the object. In it, Hugh describes the drawing as an *exemplar*, amongst other terms, see, Conrad Rudolph, *The Mystic Ark: Hugh of Saint Victor, Art, and Thought in the Twelfth Century* (Cambridge, 2014), p. 502.

⁹⁴ Erich Auerbach, 'Figura', trans. Ralph Manheim, *Scenes from the Drama of European Literature* (Minneapolis, 1984), pp. 11-78.

⁹⁵ Ibid., p. 30.

⁹⁶ Ibid., pp. 23-24.

⁹⁷ I have enumerated Vitruvius' description of technical drawings in the introduction, showing that the terms *ichnography*, *orthography*, and *scenography*, correspond to plans, elevations, and perspective drawings respectively. The terminology he uses to refer to the drawings is worth emphasising at this point, 'Ichnography (plan) demands the competent use of compass and rule; by these plans (*formarum*) are laid out upon the sites provided. Orthography (elevation), however, is the vertical image of the front, and a figure (*figura*) [...]. Vitruvius, *Vitruvius on Architecture*, trans. Frank Granger (Cambridge, Mass., 1998), I.II.2, pp. 24-27.

it would seem Auerbach's point is that for Vitruvius all technical architectural drawings may be termed *figura*. This would mean that not all *figurae* are ground-plans, but all ground-plans are *figurae*, containing properties which allow them to be termed as such.

One of the earliest medieval examples of the term *figura*'s association with a specific type of image appears in Calcidius' commentary and Latin translation of Plato's *Timaeus*. Near the beginning of the commentary Calcidius offers an outline of what the text contains, writing,

*In hoc porro libro cum de statu agatur universae rei omniumque eorum quae mundus complectitur causa et ratio praestetur, necesse fuit multas et varias existere quaestiones: de planis figuris, de solidis corporibus, de incorporatione animae vivificantis sensibilem mundum, de motu eius et agitatione perpetua, de stellarium discursibus ratis et errantibus.*⁹⁸

The section corresponding to Calcidius' statement of purpose considers *De genitura mundi*. This begins, '*Iam ut doceat mundi corpus perfectum esse – perfecta porro corpora sunt solida quae ex tribus constant, longitudine latitudine crassitudine, prius epipedas, hoc est planas figuras, quae longitudinem modo et latitudinem, nullam vero profunditatem habent, exponit.*'⁹⁹

The subsequent section considers the relationship between arithmetic, in the sense of number theory, and geometry. Calcidius demonstrates that particular groups of numbers, such as six, twelve, and twenty-four, may be placed in particular patterns to form shapes; the *figurae* to which he earlier referred. The diagrams which Waszink provides with the texts were not universally transmitted in the manuscripts, hence it may not always have been clear what

⁹⁸ 'Furthermore, in this book, since it treats the entirety of things and everything, the world is encompassed; its reason and rationale is furnished. It is necessary to examine many and different questions, concerning plane figures, solid bodies, the embodiment of the living soul in the sensible world, concerning its movement and continuous working, concerning the rational movement and the wandering of the stars.' Plato, *Timaeus*, p. 58.

⁹⁹ 'The body of the world, it is taught, had been completed, the solid bodies having been completed were from the three constants - length, width, and depth - first plane, flat things, this is plane figures are explained, figures which have length and width, but they lack any depth.' Ibid., p. 61.

exactly the *figurae* constituted.¹⁰⁰

Nevertheless, Calcidius' work provided one of the most important sources for information about the natural world, as well as the only source for Plato's writings up to the twelfth century.¹⁰¹ *Figura* in this sense acts as an indicator for the form under discussion, namely that it would involve the incorporation of diagrams in some way; *plana* demonstrates that the particular *figura* under discussion will only consider two dimensions while the *solidus corporibus* consider three dimensions. Auerbach did not mention the appearance of *plana* alongside *figura* in his discussion, but, as we will see, it represents an important aspect of *figura* in the development of quadrivial texts during the early Middle Ages

Gerbert of Aurillac makes particular mention of Calcidius' commentary on *Timaeus*, and provides examples of *figurae* for the reader to inspect.¹⁰² Moreover, Gerbert offers an extended definition of *figurae*, writing, *figura, quae Graeca scema vocatur, est spatium certis terminis inclusum*.¹⁰³ This definition is taken from Augustine's text *De quantitate animae*.¹⁰⁴ Unlike Augustine, Gerbert continues the definition, writing:

Figurae planae dicuntur, quae profunditate, id est altitudine, carentes in longitudine tantum latitudineque considerantur. Hae vero, si rationabiliter proponuntur, aut rectis lineis, quae Graece euthyae dicuntur, determinantur et angulatae sunt, appellanturque euthygrammae; aut curvis seu circumferentibus lineis, quas Graeci cyclicas sive elycoydas sive campellas vocant, includuntur, et rotundae sive oblongae sunt, et campylogrammae nominantur, vel certe utrisque, id est rectis et curvatis, componuntur, et partim angulatae,

¹⁰⁰ Murdoch, *Albums*, p. 360.

¹⁰¹ Ibid., p. 31.

¹⁰² Bubnov (ed.), *Opera Mathematica*, tables 1-4. Saint Victor most likely held a copy of the Calcidius' commentary, although it is now lost: Gilbert Ouy, *Les manuscrits de l'abbaye de Saint-Victor* (2 vols., Turnhout, 1999), II., p. 528.

¹⁰³ '*Figura*, which is called *scema* in Greek, is a space enclosed by certain boundaries.' Ibid., p. 64.

¹⁰⁴ '*Figuram interim voco, cum aliquod spatium linea lineisve concluditur*', 'Meanwhile I call a figure, when some space is enclosed by a line or lines of some sort.' PL 32: 1041.

*partim lunatae seu rotundae sunt, quod genus micton a Graecis dicitur. Quae singulae, prout commodum et utile videbitur, in consequentibus apertius describentur.*¹⁰⁵

Here Gerbert outlines various types of plane figures. The geometric figures are identified by the shapes used in their construction, and examples are provided alongside the text. The plane nature of the figures stems from their use of only length and width and the lack of depth or height in the construction of the images. This is the clearest definition of *plana figura* before Richard's use of the term in *In visionem Ezechielis*.

Richard also shares one important comment on the use of plane figures with Gerbert, implying Richard was possibly influenced by Gerbert's definitions when constructing and discussing figures. Gerbert describes the process of dividing a square into separate sections to create sixteen new squares, highlighting the difference in method between its application to plane and to solid figures. At the end of the text he states, *quod a quolibet facilius poterit intelligi, quam in plano de[s]cribi.*¹⁰⁶ Taken in context, Gerbert's use of *in plano* refers to the plane drawings which he goes on to describe in detail. However, he is clearly aware of the relationship between representations of objects in two dimensions and representations in three dimensions, the latter of which is able to provide more information about an entity compared to the former. There are two implications from Gerbert's statement, first that a plane figure may be one part of a solid figure, and that plane figures are necessarily limited in what they can depict. Richard makes a similar statement, which is discussed in detail below; however, for now it is enough to note that both Richard and Gerbert recognised that all plane

¹⁰⁵ 'Figures are called plane which lack depth, that is height, they are only considered in [terms of] length and width. These are, if rationally shown, either with straight lines, which are called *euthyae* in Greek, they [the plane figures] are delimited or angled, and are called *euthygrammae*; or they are bounded with curved or rounded lines, those the Greeks called *cyclicas* or *elycoydas* or *campellas*, or are rounded and oblong shapes, which are named *campylogrammae*, or some composed with both, that is with straight and curved lines, and partly with angles, partly curves or are round, a type which is called *micton* by the Greek. One by one these, as will be seen in a useful and helpful manner, will be described in the following.' Bubnov, *Gerberti*, p. 64.

¹⁰⁶ 'because it will be able to be understood easily from that which is to be described in *plano*.' Ibid., p. 57.

figures exhibited similar characteristics, which included the ability to be combined to form solid figures.

This rich vocabulary for discussing any associated diagrams within a text is more sophisticated than previously thought.¹⁰⁷ It provides Richard with a technical vocabulary to discuss aspects of his work which are peculiar to him. In several places Richard acknowledges that there is a serious problem with his measurements, namely that since the structures are placed on the side of a mountain the oblique angle on which the entire complex is situated reduces the dimensions to a proportionate degree. For example, Richard points out, *tamen vel quantum de illo medio centenario ab Occidente secundum rationem plani tumor montis detraxerit*, and *Sed plane quod secundum planum locus non habuit, ei ex tumore montis accrevit*.¹⁰⁸ One of Richard's many innovations in his commentary is to approach the structures as an entire entity which is subject to changes based on its site; hence he recognises that the slope of the mountain will affect any measurements that he describes.¹⁰⁹

Richard's use of *planum* in this regard is interesting and bears scrutiny. To help illustrate the effect of the slope on the measurement of the buildings Richard provides the geometrical figure (fig. 68).¹¹⁰ He uses the term *planum* to describe the measurements he makes based on the assumption that the site of the Temple complex was flat. He contrasts this *planum* measurement with the term *superficies*, a term corresponding to a measurement which takes the slope of the mountain into account. For example, he writes, *Primo itaque consideremus, quot cubitos interius atrium ab Oriente in Occidentem secundum*

¹⁰⁷ E.g., Cahn only briefly discusses the relationship between Ezekiel's and Richard's architecturally orientated language, Cahn, 'Architecture and Exegesis,' p. 65.

¹⁰⁸ However, the slope of the mountain will have reduced the size in this middle one hundred [cubits] from the west according to the reckoning of the plane figures [*plani*]. PL 196: 566B Also, 'But clearly that place was not calculated according to a *planum*, it added to the size from the swelling of the mountain.' Ibid., 196: 587B

¹⁰⁹ Richard's discussion of this proportionate change will be discussed below, where he outlines his method in detail.

¹¹⁰ The rationale behind Richard's figure will be discussed below, pp. 176-179.

*considerationem plani habeat, quod superficietenus in omnem partem absque omni ambiguo centum cubitorum erat.*¹¹¹ Here Richard contrasts the measurements of an object placed on a flat surface with one resting on a surface which is at an angle, such as a sloping mountainside. Richard's first use of *superficies* appears slightly different from his subsequent use of the term. In chapter three he considers a discrete set of 500 cubits, and the structures which are placed within that space, *Hoc tamen secundum plane superficiei considerationem dictum sit, nam ad hanc mensuram tumor montis nonnihil adjecit, de quibus in loco suo diligentius considerare oportebit.*¹¹² Here *plane superficiei* is a genitive construction where *plane* acts as an adjective modifying *superficiei*. The only other occurrence of *planum* acting in this manner is Richard's description of a flat roof.¹¹³ However, we can compare Richard's phrasing to pseudo-Boethius' *Geometria I, Plana superficies dicitur quae aequaliter in rectis suis lineis continetur.*¹¹⁴ This statement provides a relatively clear definition of what a surface is. Adelard of Bath's Latin translation of Euclid's treatise on geometry appeared just before the latest recension of *In visionem Ezechielis*, around the middle of the twelfth century.¹¹⁵ In it Adelard also writes, *Superficies plana est ab una linea ad aliam extensio, in extremitates suas eas recipiens.*¹¹⁶ From this, it would seem that Richard has slightly confused the sense in which the phrase appears in contemporary geometrical texts, where there is nothing to suggest that *plana superficies* is

¹¹¹ 'And so, first let us consider how many interior cubits from east to west the atrium has according to the consideration of the plan, which the surface was in every part and from each [part] of the hundred cubits.' PL 196: 573D.

¹¹² 'This, however, was said according to the consideration of the two-dimensional or flat surface, for the slope of the mountain has increased to this measurement, about which it ought to be more correctly considered in its place.'

¹¹³ *et forte secundum morem terrae Palaestinarum debemus intelligere tectum portae planum esse*, 'According to the habit of Palestine we should understand the roof of the gatehouse to be flat.' PL 196: 554C.

¹¹⁴ 'A plane surface is one which is equally contained in its straight lines.' PL 63:1307B. The exact nature of a plane surface is still not entirely clear from this definition, although it would seem to emphasise the two-dimensional nature of plane figures such as the square, circle, or triangle.

¹¹⁵ Euclid, *The First Latin Translation of Euclid's Elements Commonly Ascribed to Adelard of Bath*, edited by H.L.L. Busard (Toronto, 1983).

¹¹⁶ 'A plane figure is an extension from one line to another, enclosing them at their ends.' Ibid., I. 7., p. 32.

exclusively associated with elevated or oblique surfaces. In Richard's work *superficies*, without the modifier *planum*, denotes the surface on which the prophet would have walked. It corresponds to the three-dimensional structures which Richard attempts to re-create, but this does not seem to reflect contemporary usage found in Boethius and Adelard's translation of Euclid's work. Richard is, in a sense, appropriating developments in geometry to solve the problem of discussing a three-dimensional reconstruction. Richard's association of *plana* and *superficies* with geometry becomes explicit when he begins to explain the effect the slope of the mountain has on the measurements, which is explained in the following section.

It is possible to be more specific about the way Richard uses the term *planum* in *In visionem Ezechielis*. In chapter six Richard discusses the appearance of a gatehouse to the north of the Temple complex. The complex has identical structures on three sides, and hence Richard need only discuss one in detail in order to describe all four. Richard provides three plans for the building: one which gives the overall footprint of the building which lacks detail (fig. 60), one which illustrates the rooms on one side (fig. 61); and another, larger one, which delineates the ground-floor rooms of the entire structure (fig. 62). The textual references to the drawings do not use the term *planum*. The three drawings are introduced as follows, in the order mentioned above, first: *Haec itaque tria vestibula unum medium, et duo lateralia, erant sibi invicem in hunc modum conjuncta et implebant cubitos sexaginta.*¹¹⁷ Second diagram: *Vestibulum in septem sectiones dividerent, sub oculis repraesentemus.*¹¹⁸ The final diagram: *Proportionem facile possit ex eius contemplatione colligere.*¹¹⁹ On this final drawing Richard also comments,

¹¹⁷ 'The three vestibules, one in the middle and two on the side, were joined together in this manner, and take up sixty cubits.' PL 196: 544D

¹¹⁸ 'The vestibule was divided into seven sections, let us represent [them] under [your] eyes.' PL 196: 546C

¹¹⁹ 'One is easily able to put together the proportion by thinking about it [the drawing].' PL 196: 550A

*Sed quia difficile, seu etiam impossibile est longitudinem, et latitudinem, et altitudinem aedificiorum in plano sub eadem figura repraesentare, sufficere arbitror omnium horum quae diximus, situm, locumque conformasse, et lineis proportionalibus ductis omnium eorum quasi quoddam fundamentum jecisse.*¹²⁰

Here Richard correctly points out the limitations of the plan format, namely, it is only able to illustrate one particular level of the building; the upper levels cannot be represented in the same drawing as the floor-plan, a limitation echoed by Gerbert as we noted above. This problem would be overcome at the beginning of the thirteenth century in Villard de Honnecourt's portfolio. He illustrates details from the vaulting of a space in the same drawing as the floor-plan, such as the bosses and arches (fig. 69).¹²¹ This is not to say that there is a direct and explicit connection between the two drawings, only that Villard's manner of representing a ground-plan was able to contain more information compared to Richard's. One important aspect of geometrical language is apparent in Richard's statements about the drawings. First, Richard may not be specifically calling the drawings 'plans' but he certainly understands them to be *figurae*, in much the same sense as Vitruvius classified *orthographia*. The figures, taken together, attempt to represent all three dimensions of a building, but including height in a plan is, for Richard, 'impossible.'¹²² In this case he does not discuss the problems of the measurements which should take into account the slope of the mountain, as he has done so elsewhere.¹²³ Indeed, there is for the first time more detail provided about the drawing which accompanies this section, namely that it demonstrates an image of the building

¹²⁰ 'But because it is difficult, or even impossible to represent the length, width, and height of buildings in plan within the same figure; for all the things we've talked about, I judge it sufficient to have described the site and place, and to have drawn all of them using proportional lines, as if a certain foundation was placed.' PL 196: 549B.

¹²¹ Barnes Jr., *Portfolio*, p. 84.

¹²² Hugh, in his *Mystic Ark*, also identifies the problem of representing a three-dimensional structure on a two-dimensional surface, Rudolph, *Mystic*, p. 410.

¹²³ E.g., in contrast to understanding the measurements taken as *superficies*.

as if just the foundations were laid. This is a highly accurate description of the *figura* under discussion, for which the description *in plano* is an excellent identifier. We have already seen that architectural drawings could all be called *figura*, but particular formats of architectural representation could be defined separately.¹²⁴ Here Richard states the particular form of this *figura*, that it is ‘represented in plan.’

From this analysis it is clear that Richard associates the word *planum* with the ground-plan of the northern gatehouse (fig. 62), likening it to an image formed as if we were looking at the foundations. This usage is the first textual evidence for the term *planum*’s appearance in reference to a ground-plan drawing, very similar to modern technical drawings. Earlier vocabulary used in relation to ground plans do not describe them as a *planum* or *planum figura*. For example, Adomnan’s *De locis sanctis* is inconsistent in the language he uses to describe the accompanying drawings, referring to them as *formulae*, *exemplar*, *figuratione*, and *figura*.¹²⁵ At no point does he refer to the drawings as *planum*.

The term *planum* does not appear either on the Saint Gall plan. A contemporary message added to the top right corner of the plan reads: *Haec tibi dulcissime fili cozberte de*

¹²⁴ For example, Vitruvius refers to elevations as both *figura* and *orthographia*, discussed above, p. 31.

¹²⁵ *Supradictae igitur rotundae ecclesiae formulam cum rotundo tegoriolo in eius medio collocato, in cuius aquilonali parte Dominicum habetur sepulchrum, subiecta declarat pictura, nec non et trium aliarum figuras ecclesiarum, de quibus inferius intimabitur. Has itaque quaternarium figuras ecclesiarum [sic] iuxta exemplar quod mihi, ut superius dictum est, sanctus Arculfus in paginola figuravit cerata depinximus, non quod possit earum similitudo formari in pictura sed ut Dominicum monumentum licet tali vili figuratione in medietate rotundae ecclesiae constitutum monstretur aut quae huic propior [sic] ecclesia vel quae eminus posita declaretur* ‘The drawing appended indicates the shape of the round church mentioned above, with the round domed structure placed in the centre of it, in the northern portion of which is the Lord’s sepulchre. It exhibits also plans of three other church, of which there will be an account below. We have drawn these plans of the four churches after the model which (as already stated) the holy Arculf sketched for me in a wax surface. Not that it is possible to exhibit their likeness in a drawing, but in order that the *monumentum* of the Lord might be shown, placed as it is in the middle of the round church, albeit in a rough sketch, of that it might be made clear which church is situated near or far away from it.’ Ibid., I.II.14-15, pp. 46-47; *cuius figura inferius describitur*, ‘A plan of it is given below.’ Ibid., II.XXI.2, pp. 90-91. Although Meehan translates *figura* as ‘plan’ this chapter has demonstrated that this is a problematic rendering of the Latin.

posicione officinarum paucis exemplata direxi.¹²⁶ There is some debate over what the author means by *exemplata*; however, it is clear that this important architectural drawing, completed before the thirteenth century, does not use the word *planum* to describe a ground plan.¹²⁷ There is no indication of the term's use before Richard's. Hugh of Saint Victor uses the term in a highly similar manner, indicating a direct influence on Richard; however, it is not possible to associate Hugh's usage with an extant drawing. As a result, *In visionem Ezechielis* represents the first time 'plan' was used to describe an image of a building's footprint, usage which continues to this day.¹²⁸

Richard uses other terms to describe the drawings, such as when he introduces the plan at the end of chapter twelve, *Horum omnium quae diximus in novissima, et magna figura, sicut ibi videri potest, formam et exemplar latius expressimus*.¹²⁹ This is the second use of *exemplar* in this text to describe a plan in particular, and especially plans which seek to represent large areas or structures.¹³⁰ The term, in this sense, corresponds to similar usage in Scripture; for example, when God describes the making of the Ark and its liturgical vessels. He states: *inspice et fac secundum exemplar quod tibi in monte monstratum est*.¹³¹ Two other examples of the term used in relation to models for objects appear in Scripture; *misit rex Ahaz ad Uriam sacerdotem exemplar eius et similitudinem iuxta omne opus eius*,¹³² and *vide inquit*

¹²⁶ 'For thee, my sweetest son Gozbertus, have I drawn this briefly annotated copy of the layout of the monastic building.' Horn, Born, *The Plan*, p. 9.

¹²⁷ Horn, as the translation given indicates, translates *exemplata* as 'copy.' However, this translation was subsequently challenged by Paul Meyvaert, who believed it implied the artist had worked everything out through the plan. Cited in, Warren Sanderson, 'The Plan of St. Gall Reconsidered', *Speculum*, 60 (1985), pp. 615-632, here p. 617.

¹²⁸ The Oxford English dictionary traces the noun's usage to the sixteenth century, derived from Middle French usage. In the fourteenth and fifteenth centuries the ground-plan was known as 'plattes', or 'plottes', but not as a 'plan', L.F. Salzman, *Building in England down to 1540* (Oxford, 1992), p. 15.

¹²⁹ 'All these things we have spoken about in the last section, and in a large figure, as can be seen here, we more extensively describe the form and design.' PL 196: 566C

¹³⁰ The first appears in chapter three: *Horum itaque quae diximus tale exemplar formamus*. PL 196: 541D.

¹³¹ 'Look, and make it according to the pattern that was shown to you on the mountain.' Ex. 25.40.

¹³² 'King A'haz sent to the priest Uriah a model of the altar and its pattern, exact in all its details.' 2 Kings 16.10

*omnia facito secundum exemplar quod tibi ostensum est in monte.*¹³³ In two of these cases *exemplar* represents a design for an object which can be conveyed to another person, and corresponds with Richard's use of the term which explicitly ties it to plans. Richard's contemporary Joachim of Fiore (d. 1202) comments on the Exodus passage:

*non quasi ex similitudine fingenda est veritas, sed magis, veritate perspecta, propter eos qui tardioris sunt ingenii, similitudo significans adhibenda, talem nos cedri huius ymaginem assignare oportet, qualem eam pro dono gratie in montis vertice contemplati sumus, non quales in silvis montium consueverunt inveniri.*¹³⁴

Joachim alludes to the relationship between 'truth' and likenesses or *similitudines* in this passage. Truth is the ultimate objective in presenting likenesses, but it is acknowledged that likenesses can only ever be imperfect, and presented for those of 'slower ability.'¹³⁵ We have already seen that Richard's aim in writing *In visionem Ezechielis* in the form of a historical commentary was to determine the truth of the past, and that Richard's provision was to help the student to understand. Bernard McGinn argues that for Joachim, 'the *figurae* were not mere mental constructions, but reflected eternal realities, or ideas, in the mind of God.'¹³⁶ Similarly for Richard I would argue that his vocabulary for describing his drawings and their measurements is orientated towards explicating and discovering truth, and historical truth in

¹³³ 'See that you make everything according to the pattern that was shown you on the mountain.' Heb. 8.5 There are four other instances of the term, Deut. 17.18, Ez. 4. 11, 5. 6, and 7. 11, each of these is concerned with the copying of particular letters.

¹³⁴ 'For truth is not to be fashioned in any kind of likeness. Rather, when the truth has been seen, for the sake of those who are of slower ability a meaningful likeness is to be employed, just as we had to employ the kind of image of the cedar tree similar to the one we contemplated upon the mountain peak by the gift of grace, and not those trees we are accustomed to find in mountainside woods.' Translation taken from McGinn, 'Image as Insight', p. 99. Interestingly, the use of *fingenda*, and its root *fingere* resonates with Auerbach's discussion of *figura*, Auerbach, 'Figura', p. 11.

¹³⁵ 'Dabimus interim huius rei aliquod documentum. per quos possit quivis quantumlibet simplex assertionis nostrae capere et experimentum' PL 196: 575. 'For the present, we give some evidence by which anybody, no matter how simple, can satisfy himself of the truth of our assertion.'

¹³⁶ Bernard McGinn, 'Image as Insight in Joachim of Fiore's *Figurae*', in Giselle De Nie and Thomas Noble (eds.), *Envisioning Experience in Late Antiquity and the Middle Ages: Dynamic Patterns in Texts and Images* (Farnham, 2012), pp. 93-118, here p. 97.

particular. The geometrically infused language of *figura*, *planum* and *exemplar* helped to underline this point.

Geometrical Drawing

Three types of drawings appear in *In visionem Ezechielis*; the geometrical image, the plan, and the elevation, each of which attempt to portray a level of exactitude rarely found in medieval texts and images, and in his descriptions of these we can determine the role geometrical language plays in Richard's writing.

One of the key drawings in *In visionem Ezechielis* appears in chapter 15 and it provides the reader with the necessary knowledge to determine how the *in plano* dimensions compare to the *superficies* measurements (i.e., how those measurements taken as if the site was flat can be converted into those that take the angle of the mountain into account). The latter measurement (i.e., the *superficies* measurement) indicates the true measurements of the prophet's footsteps (fig. 68).¹³⁷ Dale Coulter describes the figure simply as the most obviously geometrical drawing in Richard's work, without considering its actual function.¹³⁸ Walter Cahn refers to it but does not explain how it fits in with Richard's measurements other than it being used to determine the slope of the mountain.¹³⁹ Catherine Delano-Smith acknowledges its presence in the many manuscripts she consulted, but does not offer any discussion of it.¹⁴⁰ All authors miss the underlining purpose, that it provides the proportional relationship between the two types of measurements, acting as a key through which dimensions can be translated, and thus truly reflect historical reality.

¹³⁷ There is an extended explanation of these terms and what they refer to below, pp. 178-179.

¹³⁸ Coulter, *Per Visibilia*, p. 70.

¹³⁹ Cahn, 'Architecture', p. 59.

¹⁴⁰ Delano-Smith, 'Jerusalem', pp. 48-49.

The drawing is constructed as follows (fig. 70). Richard asks the reader to draw a horizontal line, dividing it into five equal sections, assigning the letters A B C D E and F along equally spaced points on the line.¹⁴¹ A vertical line is then placed above the E section. This second line should be divided into three sections (G H and K), of equal length to the sections contained in the first line (A F). Richard then points out that if a circle is drawn with a radius of A F it will demonstrate that the distance between A F is equal to the distance between A and K. A line is then drawn from A to K, which completes the construction of a right-angled triangle. Richard suggests that each section, such as A to B or B to C, should be assigned the length of 20 cubits and that, as long as the triangle was constructed in the manner he describes, the actual size of the figure does not matter because it will have the same proportion as the one in the text. As a result, the line A F is 100 cubits in length, and the line EK will be 60 cubits (obviously in this construction, with Richard having demonstrated the equal length of A F and A K, the latter will be 100 cubits as well).¹⁴²

Richard's use of geometry in this fashion corresponds to the twelfth-century definition of practical geometry, which Hugh of Saint Victor defines as the use of 'instruments, and gets

¹⁴¹ The process is visually reconstructed in figures 12-14.

¹⁴² Because Richard's description of this section is so precise I quote the entire original text: *Protrahatur cujuslibet magnitudinis linea in quinque aequas sectiones divisa, et ad singulas sectiones singulis litteris insignita. Sitque linea jacens A B C D E F. Supra hanc ad quartam sectionem, id est, super E alia linea erigatur, ita ut in nullam partem pronior inclinetur, sed hinc inde rectos, et adinvicem pares angulos efficiat, et tres mensuras praedictis sectionibus singulas singulis aequales contineat. Sitque linea super E erecta E G H K. Protrahatur adhuc tertia linea de A in K oblique elevata. Hoc itaque facto accepto circino, si primam et tertiam lineam, id est, A F et A K aequales inveneris, assertionis nostrae fidem proprio experimento tenebis. Ponatur itaque ut unaquaeque sectio sit viginti cubitorum. Erit ergo A F, id est, prima linea cubitorum centum, et A K ejus videlicet aequalis, id est, tertia linea erit totidem cubitorum. Linea vero erecta, id est, E K, habebit cubitos sexaginta. Atrium igitur, quemadmodum dictum est, quod octoginta cubitos habuit in base, et centum cubitos in superficie absque dubio sexaginta cubitis elevatior fuit in eminentiori parte, cujus rei formam manifeste habes in triangulo A K E. Hujus autem trianguli basim, id est, lineam jacentem, ejus quae hypotemisam, id est, lineam inclinatam si quantumlibet protraxeris, et eis cathetum, id est, lineam orthogonaliter erectam applicaveris, cujuscunque magnitudinis triangulos effeceris, tres ejus lineas eadem sibi semper proportionem respondere videbis. Nam semper erit hypotemisa ad basim sexquiquarta, et basis ad cathetum sexquitercia.* PL 196: 575C-D.

its results by working proportionally, from one figure to another.¹⁴³ If we compare Richard's description of the triangle, quoted above, with Hugh's *Practica geometria*, we find almost the exact description of the lines of a triangle. Hugh writes:

Consider a right triangle. Its base is the lower line, set along the ground. Its perpendicular is a line at the base end, raised straight up, so that it inclines to neither side, but makes a right angle, where it meets the base. The hypotenuse is a line from the top of the perpendicular to the far and opposite end of the ground line (i.e., the base). It descends obliquely, and so makes an acute angle at both ends.¹⁴⁴

Richard's identification of the triangle's elements is clearly influenced by Hugh's work. The individual elements, such as the base and hypotenuse, are identified in a similar manner. Hugh also continued to discuss the proportional properties of the right-angled triangle, writing, 'This triangle can never have all its sides equal. Sometimes there are no equal sides; sometimes two, i.e., base and perpendicular. The hypotenuse never equals the other two.'¹⁴⁵ It is the proportionality of the right-angle triangle which allows Richard to create an equivalence between the hypotenuse and the base line. Manuscripts of Hugh's work tend to include drawings which illustrate the point in more detail. For example, Paris, Bibliothèque nationale de France, MS lat. 7185, ff. 81v-83r provides an illustration of a right-angled triangle, but there is no suggestion regarding how it was made or to what use it could be put. Richard's illustration and the process through which he constructs it would seem to be connected with Hugh's work on geometry.

Richard's diagram and its accompanying discussion, however, is different from Hugh's,

¹⁴³ Hugh, *Practical Geometry*, I.2, p. 34. Underlining this conformity is the presence of pin holes at the centre of the circles in the Bodleian manuscripts of the text, implying that compasses were used to create the circles.

¹⁴⁴ Ibid.

¹⁴⁵ Ibid., I.3., p. 35. Hugh also states there is much more to be said on the subject of triangles, but suggests he would write about it elsewhere. No work exists on the topic however.

the former exhibiting a more sophisticated awareness of the shape's properties compared to Hugh's mere description of the figure. In Richard's geometric figure the hypotenuse represents the mountain's slope, which he likens to the *superficie* measurement. It is the 'surface' on which the prophet would have actually walked. He clearly describes the proportional relationship between each side in terms of an arbitrary set of numbers.¹⁴⁶ This relationship between the hypotenuse and the site of the building is made explicit in a thirteenth-century English copy of the text, where the scribe has added the note *devexitas montis* along the hypotenuse.¹⁴⁷ In this manuscript the same note has been added to the lateral elevation of the building north of the Temple on f. 103r, where it follows the slope of the mountain. By discussing the proportional properties of the triangle Richard touches on Pythagoras' theorem that 'in right-angled triangles the square on the side subtending the right angle is equal to the sum of squares on the sides containing the right angle.'¹⁴⁸ From Richard's figures it is a relatively easy process to determine the truth of this statement.¹⁴⁹ However, Richard never explicitly states or refers to any aspect of the theorem, and could have determined the truth of his proportions without knowing it. Strictly speaking Richard only illustrates that the hypotenuse is in a proportional relationship with the base line to some degree. This geometrical figure, however, offers a visual key to Richard's measurements. Those which he cites as *secundum planum*, should be interpreted as correlating to the base of the triangle.¹⁵⁰ Knowing this, it is possible then to determine the *superficies* measurement by

¹⁴⁶ 80 cubits for the base line, 60 cubits for the perpendicular, and 100 for the hypotenuse. In Oxford, Bodleian Library, MS e Museo 62, the scribe has added a *titulus* to the line A K which describes it as the slope of the mountain.

¹⁴⁷ Ibid., f. 96r.

¹⁴⁸ Euclid, *The Thirteen Books of Euclid's Elements*, trans. Thomas L. Heath (New York, 1956), I. prop 47, p. 349. In algebraic terms: $a^2 + b^2 = c^2$

¹⁴⁹ E.g., following the above equation we see that $80^2 + 60^2 = 100^2$.

¹⁵⁰ Hugh uses the same phrase, *secundum planam*, in his discussion of the triangle, cf. Hugh, *Opere Propaedeutica*, p. 32.

applying the same processes Richard describes in the creation of the triangle.

Elevations

The reason Richard presents the elevations of a structure he discussed much earlier in the text relates to the inclusion of the geometrical figure at this stage. Directly after chapter fifteen and the description of the theory underlining the slope of the mountain Richard presents two elevations of the northern gatehouse.¹⁵¹ It is only by presenting his theory regarding the slope of the mountain that Richard is able to bring together the elevation drawings, and he does so at the earliest opportunity.¹⁵² In the lateral elevation of the northern gatehouse (fig. 65) Richard presents the tripartite vertical structure comprising the ground floor (the *thalami*) and two upper rooms (*coenacula*). This accords with Richard's description above, which describes the outer part (*exterior parte*) as rising to 90 cubits, and the inner part as 45.¹⁵³ One side of the gatehouse is much higher than the other, because of the mountain's slope. The importance of Richard's incorporation of the slope is clear in terms of the length of the building. Comparing the lateral elevation with the previous figure of the right-angled triangle it becomes obvious that the length of the gatehouse is affected. Using Richard's dimensions we see that the measurement along the baseline (*in plano*) would be 80 cubits; however by the measurement along the sloped base of the gatehouse it would be 100 cubits (*superficies*). The longer measurement allows for Richard to incorporate the full size of the structure in a highly sophisticated process of proportional measurement.

In order to demonstrate the height of the building Richard divides the building into

¹⁵¹ In Bodl. 494 the last plan of the gatehouse appears on f. 139v, but the front and lateral elevations do not appear until ff. 155v and 156r.

¹⁵² The enumeration of the northern gatehouse's measurements appears in the previous chapter.

¹⁵³ The 'outer part' refers to the side not facing the inner courtyards, and appears on the left side of the lateral elevation; the inner part appears on the right.

three primary parts, an arrangement which helps define the two elevation drawings and their *tituli* (figs. 64-65, and 71). The total height of the building is 90 cubits, the top part is made up of two upper rooms each measuring 20 cubits in height, and an additional five for the crenellations. The bottom 45 cubits extend from the ground to the top of the chambers.¹⁵⁴ Richard's descriptive technique is to separate the building into discrete parts, measure each of them individually and then add the results at the end. This technique works well in text form but the conceptual approach to the drawing is surprising. Richard envisions an internal structure with stairs ascending through the central hall. The stairs are shown in bright red lying on top of a series of curving lines which represent the mountain (fig. 65).¹⁵⁵ The columns spring out of the ground without any bases, but are aligned perfectly with each step.¹⁵⁶ Set on top of the stairs are the chambers (*thalami*) which are shown as small barrel vaulted spaces; in each chamber there is an accompanying *titulus* which describes what is being depicted.¹⁵⁷ The first *coenaculum* on the outer side is accompanied with the note, *ab hinc sursum cenaculum primum ab exteriori latere*.¹⁵⁸ The top floor on the inner side of the building has multiple *tituli* attached. That which appears underneath the vaulted space states, *tabulatum*

¹⁵⁴ *A tecto autem thalami, id est, a pavimento coenaculi usque ad tectum portae fuerunt, ut legitur, cubiti viginti quinque. Jungantur isti viginti quinque superioribus, et quadraginta habemus. His omnibus et adhuc supra tectum ipsius portae quasi ad propugnacula facienda quinque cubitos adjicimus, et sic quadraginta quinque cubitos altitudinis ab interiori parte implemus. Erat autem, ut superius dictum est, quadraginta quinque cubitis demissior in exteriori latere, et secundum hoc tota ejus altitudo ab exteriori parte videtur in nonaginta cubitos consurgere.* PL 196: 576C-D.

¹⁵⁵ The *titulus* reads *devexitas montis in ea parte in qua habet porticum triplicem*. 'The slope of the mountain in each part on which it has a triple gateway.'

¹⁵⁶ Walter Cahn, 'Architectural Draftsmanship', p. 250. Cahn seems to misunderstand this section, as he does not understand why Richard has placed the steps inside the building, although Richard clearly states that there are two sets of steps. The more pertinent question is why Richard omits the exterior steps from his frontal elevation. *Hinc est, quod de australi portico exterior legitur: Et in gradibus septem ascendebatur ad eam; et item australi interior: Et octo gradus errant quibus ascendebatur per eam.* PL 196. 535B. 'Here is what is read about the southern exterior gate: There were seven steps ascending to it; and likewise to the southern interior side: and there were eight steps through which they ascended through it.'

¹⁵⁷ Starting from the outer side (i.e., the left) and moving upwards towards the inner side (i.e., moving right), these *tituli* read: *vestibulum. . viii. cub; sicut primi thalami; .v. cubita inter thalami; situs secundi thalami; .v. cubiti inter thalami; situs tertii thalami; vestibulum. viii. cubitorum*. These *tituli* are consistently represented across the Oxford manuscripts, and appear in Paris, BnF, MS lat. 14519.

¹⁵⁸ 'From here rises the first floor room the outer side.'

cenaculi et erat pro recto thalami, above this set within the space, *mensus est porta ab tecto thalami usque ad tectum eius xxv. cubitorum*.¹⁵⁹ Also, set within the vault of the top floor, *tectum totius porticus*.¹⁶⁰ Finally, placed just under the crenellations at the top of the drawing, *representatio porticus quasi a latere videretur*.¹⁶¹ The overall effect allows Richard to illustrate the stages of the building which he describes in detail in the text.

In all of Richard's description of the gatehouse no part discusses any decorative elements on the gatehouse's exterior, and there is no reason to believe there were superfluous elements associated with the structure. If so, we may ask how do the arches and columns represented in the elevations relate to the structure itself? The only way the viewer can see the barrel vaults is if this elevation is in fact a section, slicing through the vestibule, halls, and *thalami*. And indeed, Richard's drawing is in fact a lateral sectional elevation, and is perhaps the first example of its kind. It may be argued that Richard used the textual description, which divided the heights into three distinct parts, as inspiration to depict to the interior spaces as they appear in the diagram, this would have allowed the reader to identify the different parts correctly. The *tituli* noted above underline this fact: Richard identifies the particular spaces as the *vestibuli*, the space between the *thalami*, and the *thalami* themselves. He presents these spaces to the reader and illustrates the interior of the structure at the same time.

The early date of a lateral section is surprising, and undermines those authors who state that Villard de Honnecourt's transverse section of Reims cathedral is the earliest in the history of architectural drawing (fig. 72).¹⁶² Villard's section of Rheims cathedral cuts the

¹⁵⁹ 'The floor of the first floor and directly above the chambers.' and 'the measurement the gatehouse from the roof of the chambers to its roof is 25 cubits.'

¹⁶⁰ 'The roof of the entire gatehouse.'

¹⁶¹ 'A representation of the gatehouse as if seen from the side.' The scribe of this titulus seems to have slightly confused the matter: there is no space between the 'a' and 'l' of *a latere*, and it was originally rendered *altere*, but a corrector has added the necessary 'a.' at a later stage.

¹⁶² James Ackerman cited in Pacey, *Medieval Architectural Drawing*, p. 62.

building, allowing the viewer to see the details which would otherwise be hidden.¹⁶³ There is one likely candidate for an earlier example of a sectional elevation, but the form and context of the representation make it difficult to state definitively. The tenth-century Beatus Severus Apocalypse depicts scribes working under the roof of a building attached to a tower (fig. 73).¹⁶⁴ The background is depicted in a darker colour than the bare parchment which suggests that another space is being depicted, and serves to delineate any interior spaces. Running the height of the tower, the viewer is able to see a sequence of ladders which would allow movement upwards. There is no description with the image, thus it is difficult to be sure whether the artist intends the interior of the building to be seen. Richard's drawing is the earliest which seeks to illustrate a sustained and logical representation of architecture. Wilson states that Villard's portfolio proves many systems of architectural drawing were already present by c. 1230.¹⁶⁵ The presence of equivalent systems, albeit within a monastic context, in *In visionem Ezechielis* pushes this date back to the third quarter of the twelfth century.

Plans

The final set of geometric drawings we will examine are the plans of the northern gatehouse (figs. 60-62). These appear in three forms, moving from the general to the particular and show an exact representation of the building's footprint. The first drawings appear on f. 136v in the bottom left corner, extending left of and underneath the main text block (fig. 60). It shows a very general indication of the building's structure, with the vestibule running through the

¹⁶³ Barnes Jr., *The Portfolio*, pp. 209-10. The section is made obvious by the attention paid to the soffit rolls below the flying buttresses.

¹⁶⁴ See, J.J.G. Alexander, *Medieval Illuminators and their Methods of Work* (New Haven; London, 1992), p. 11

¹⁶⁵ Wilson, *The Gothic Cathedral*, p. 141

building. The drawing is orientated with north or south placed at the top of the drawing.¹⁶⁶ The second plan illustrates half the structure in more detail, indicating the width of the vestibule on either side, its threshold, the width of the walls, the overall length, and the width of half the structure (fig. 61). Just as in the previous plan the top is orientated towards the north or south. The third plan for this structure appears on f. 139v, and offers a detailed account of the entire building (fig. 62). The length and width of the building are indicated, as is the width of the passage running through the centre and the wall widths which lie between the chambers. In this final drawing, Richard has re-orientated this building to place east or west to towards the top.¹⁶⁷

Richard acknowledges that the description of the gatehouse is opaque and difficult to understand.¹⁶⁸ Ezekiel writes that the length of the gatehouse was fifty cubits, with a vestibule running through the middle which was 10 cubits wide, and the walls either side of this vestibule were 25 cubits, making the entire width of the gatehouse 60 cubits. The halls or vestibules on the flanking ends were 8 cubits wide, and doorways 6 cubits wide. The description appears in several places from Ez. 40: 6-23, but it is difficult to make sense of the details. Richard's method for uncovering the historical appearance followed a process perfected at Saint Victor over time.¹⁶⁹ In *In visionem Ezechielis* Richard's intention was to 'explicate individual words in a verse with the goal of helping the reader understand how they function within that particular book.'¹⁷⁰ Earlier authors thought the description of the gatehouse too difficult to make sense

¹⁶⁶ The shape of the building is symmetrical, so it is impossible to state which cardinal direction is placed where, only that the vestibule (i.e., the passage running through the centre of the building) runs north to south.

¹⁶⁷ The convention in the Middle Ages was to place east towards the top of the drawing, and it seems reasonable, in this case, to speculate that Richard has turned the drawing in this direction.

¹⁶⁸ PL., 542D-543A.

¹⁶⁹ Outlined in Mary A. Mayeski, 'Early Medieval Exegesis: Gregory I to the Twelfth Century', in Alan Hauser and Duane F. Watson (eds.), *A History of Biblical Interpretation: Vol. 2, The Medieval Through the Reformation Periods* 2 vols (Grand Rapids; Cambridge, 2009), II, p. 87.

¹⁷⁰ Michael A. Signer, 'Peshat, Sensus Litteralis, and Sequential Narrative: Jewish Exegesis and the School of St. Victor in the Twelfth Century', *Jewish History*, 6 (1992-93), pp. 203-216 (p. 204).

of, as mentioned above. As a result Richard makes use of Saint Victor's literal exegetical approach, and is able to tease out the prophet's intentions by close examination of the words. Language and the particular words that Richard uses are vital when determining his historiographical approach, and we will see that this is an important element when examining the manner in which Richard refers to his drawings.

Richard claims that his drawings are in proportion, a claim which can be tested by examining the plans for the northern gatehouse.¹⁷¹ From the simplest set of measurements it would appear that the plans are not in proportion, or at least have not been scaled properly.¹⁷² For example, the detailed drawing on f. 139v (fig. 62) states the walls on either side of the entrance are 25 cubits; if the width of the vestibule is added to these measurements the entire width of the building is 60 cubits. However, both walls, each representing 25 cubits, are different in size, the top is 58mm and the bottom is 54mm.¹⁷³ Also, the *tituli* attached to the internal walls of the chambers indicate that the width of the separating wall is 1 cubit, this corresponds to 3mm for each of the relevant wall widths. Knowing the size used to represent 1 cubit it is possible to determine whether the rest of the drawing has been scaled by determining whether 3mm divides by the number of cubits given in the drawing. For example, as mentioned, Richard gives the width of the central passage as 10 cubits, if it is properly scaled by using the given measurement for a single cubits (i.e., 3mm), it should be 30mm in size. However, this is not the case, instead the width of the passage is 20mm on the manuscript.

¹⁷¹ *ut intuentis animus eorum omnium locum, situm et numerum, qualitatem, quantitatem, proportionem facile possit ex ejus contemplatione colligere*, PL 196. 549A-550A. 'so the mind looking at all of these things; the place, the site, number, quality, quantity, proportion is easily able to collect them for its contemplation.'

¹⁷² It should be reiterated that without a confirmed manuscript with Richard's autograph it is difficult to identify the author's specific wishes for the transmission of the diagrams. However, Bodl. 494 is an early copy of the manuscript and it echoes the diagrams in the corrected copy found in Oxford's MS e Museo 62, thus representing a good copy of the latest version of the text.

¹⁷³ All measurements are taken from Oxford, Bodleian Library, MS Bodl. 494, except where stated.

None of the given measurements are in a consistent proportion with the given size of 1 cubit.¹⁷⁴ This would indicate that the drawing is not proportionate in size, or that a single modular unit was not used to draw the plan. None of the three plans under discussion appear to be proportionate, as Richard claims. This being the case, it is possible the scribe was forced to reduce the measurements in order to ensure the entire image fitted into the space allotted for it. As noted in the introduction, proportional architectural drawings do not appear until the later Middle Ages, and there is no reason to think that the scribe of Bodl. 494 attempted to create one.¹⁷⁵

Despite this, the manuscripts are consistent in the use of the respective lengths of the architectural elements, as well as the approximate proportions in each of the drawings. In the three drawings, the smaller elements of the structures are depicted as being relatively smaller to other elements. For example, in the depiction of the half building on f. 137v, there are a number of measurements given. The cubit measurements of 1, 5, 6, and 8 cubits correspond to the measurements of the 3mm, 8mm, 12mm, and 16mm respectively. This would indicate that while the modular measurement of 1 cubit being equal to 3mm on the page is not used, the artist has taken the time to ensure that those elements which are described as smaller are represented as such. This concern is also replicated in the first and simpler drawing on f. 136r, where there are four possible measurements to be taken.¹⁷⁶ Moreover, there is a correlation between the measurements of the images on ff. 136v and 139v, that is the image of the half-

¹⁷⁴ For example, the width of the vestibules on either side of the entrance is given as 8 cubits, but is 15mm on the page (proportionate length would be 24mm); the entrance to the vestibule is 6 cubits, but is 13mm on the page (proportionate length would be 18mm); the width of the buildings walls is 5 cubits, but is 10mm on the page (proportionate length would be 15mm); finally, the overall length of the building is 50 cubits but appears as 115mm on the page (proportionate length would be 150mm).

¹⁷⁵ P. 33.

¹⁷⁶ The width of the building, taken as 60 cubits, is 54mm in length, 50 cubits as 47mm, 10 cubits as 7mm, and 5 cubits as 5mm.

structure (fig. 61), and the detailed representation of the entire building (fig. 62). For example, the 25 cubit width of one side appears as 57mm in the half-structure and, as mentioned above, appears as both 54mm and 58mm in the full picture. Also, the entire length is given as 50 cubits and is depicted as 115mm in both drawings; the width of the vestibules on either end of the central passage is given as 10 cubits and appears as 15mm and 16mm on the half- and full structure drawings. This pattern is repeated down to the smaller given width of 1 cubit for the internal walls, which appears as 3mm in both drawings. It would appear that some care has been taken so that the different plans do relate to another, or that the same instrument was possibly used to make each of the diagrams.

Instead of attempting to interpret the relative proportions of Richard's plans in terms of their measurements, they may instead relate to the dry-point textual guidelines which faintly appear on the manuscript page. For example, in relation to the detailed drawing of the entire structure, the outermost vertical guidelines on the verso side aligns with the inner jambs of the vestibule entrances on the left side of the structure. The innermost vertical guideline, running parallel to the spine of the page, aligns with the inner jambs on the vestibule entrances on the other side (a distance of 89mm). The scribe, in this case, decided on the arbitrary distances given by the dry-point lines, and attempted to fit the entire drawing into the given space. The margins on either side of these lines would have provided enough room for the architectural elements outside of the jambs, meaning the artist would have known he could easily fit in the rest of the drawing using these margins.¹⁷⁷ There are no horizontal guidelines for the text in this plan, indicating that the page was left free for the drawing. There is a similar concern for the placement of the jambs in the half-structure drawing on f. 137v (fig. 61). The

¹⁷⁷ A similar method is used for the geometrical drawing illustrating the angle of the slope. The centre point of this diagram appears on the intersection of a horizontal line placed three rows from the bottom and extends close to the trimmed edges of the parchment.

artist, in this case, has extended them too far into the interior of the building, and then corrected the size by only colouring the pertinent section. The reason for this change may be to keep the measurement between the two jambs consistent with its depiction on f. 139v (fig. 62), the detailed full structure drawing. The corrected measurement between the two jambs on the half-structure drawing is 89mm, which is equal to the width of the text block. This indicates that the defining rule in the measurement and outlining of the drawings was the dry-point guidelines used for the text.

The frontal elevation of the northern gatehouse which appears on f. 150v is separated into three vertically orientated spaces (fig. 64). There is a small central passage running through the centre which is flanked by the different floors and their arcades. The effect of placing the passage in this way is to link the major formal elements of the plans with the frontal elevation. Two of the plans (figs. 60 and 62) for the building display this passage, and its reappearance in the elevation is reminiscent of previous representations of the structure, which, as mentioned, appear much earlier in the text.¹⁷⁸ Richard does not illustrate the elevations until he has outlined the manner in which he interpreted the slope of the mountain. The central passage gives the viewer a visual cue indicating to what this elevation relates, namely the previous plans. Another way the plans are linked with the frontal elevation is the exactitude of the measurements used to illustrate the two types of drawings. Above it was mentioned that the detailed plan of the northern gatehouse (fig. 62) was not in proportion because the two sides of the building, both of which are supposed to represent 25 cubits, were in fact executed in different measurements of 57mm and 54mm. With respect to the frontal elevation these are the exact same two measurements corresponding to the left and right

¹⁷⁸ Cahn uses this structure to link it to the later gateway at Pouilly-le-Fort; however, the frontal elevation recreates an almost identical form to the earlier plans makes the latter the most likely source: Cahn, 'Architecture and Exegesis', p. 63.

flanks respectively. Again, this demonstrates that while the manuscript artist, and perhaps Richard, was not concerned with the proportionate measurements, as we would recognise them today, scaling up from a particular length assigned to 1 cubit, there is an internal sense to the structures, and between the different architectural drawings. This may be due to the tools at the artist's command, or it could be because of a concern to be consistent in the three-dimensional qualities of the diagrams.

While Richard's drawings convey the approximate proportions of the drawings, they are not fully concerned with a consistent system of measurement to portray the building as perfectly proportionate. It is, however, possible to state that, in the case of Bodl. 494, the artist and perhaps Richard has taken some care to represent the building as a coherent structure where measurements roughly correspond to their given size. By the end of the twelfth century, there was no well-known precedent for depicting three-dimensional structure on a two-dimensional surface in a convincing manner. As a result the dry-point guidelines, created using a straight edge, provided a convenient geometrical backdrop on which to place the architectural diagrams. The precision the guidelines provided was supplemented by the use of compasses to draw the arches, thus conforming to Hugh's definition of 'practical geometry,' and even Vitruvius' definition of *ichnographia*.¹⁷⁹ Descriptions of architectural precision in the building process become apparent shortly before Richard completed *In visionem Ezechielis*. It is not possible to state that Richard took impetus from this emerging trend, but it is clear that Richard's drawings echo the desire for accurate representations of architecture in three dimensions.

¹⁷⁹ Hugh's definition for 'practical geometry' is quoted and briefly discussed above, pp. 89-90.

Geometrical Reality

The building block of medieval reality is geometry, which Richard uses to offer a consistent internal structure to his architectural diagrams. We will see that geometry was thought to be the very basis of God's creation, and the possession of three dimensions confers the property of solidity upon an object. In the process of describing, and thus creating, the three-dimensional measurements of an object, that object has moved from the imperceptible realm to the perceptible world one can recognise. The broader argument of this thesis is that architectural representations enabled discussion of abstract ideas within a teaching context, and *In visionem Ezechielis* fits into the role very well. Richard's work is an early example of a strong desire to measure the world, a desire which would come to the fore during the following century.¹⁸⁰ It remains to be seen how this use of geometry relates to contemporary notions of reality, allowing us to determine in what way Richard's recreated world in *In visionem Ezechielis* can be interpreted as 'real.' We will examine geometry's relationship with reality, the importance of sight as a foundation to experience, and finally a brief overview of metric relics and how Richard's work acts in a similar manner.

In much the same manner as Hugh, Richard envisages God's work as two types: *opus conditionis* and *opus restaurationis*. Richard states that, *Opus conditionis est creatio mundi cum omnibus elementis suis*.¹⁸¹ For Richard, the work of creation took place over the six days

¹⁸⁰ Alfred W. Crosby, *The Measure of Reality: Quantification and Western Society 1250-1600* (Cambridge, 1997), p. 18. One manifestation of this link between sight and experience is the emergence of the metric relic during the thirteenth century and beyond.

¹⁸¹ Richard of Saint Victor, *Liber Exceptionum*. II. 1., p. 114. 'The work of creation is the creation of the world with all its elements', 'The work of restoration is the incarnation of the Word with all of the sacraments.' Compare this with Hugh's discussion of the *opus conditionis* and the *opus restaurationis* in his *De sacramentis, Materia divinarum Scripturarum omnium, sunt opera restaurationis humanae. Duo enim sunt opera in quibus universa continentur quae facta sunt. Primum est opus conditionis. Secundum est opus restaurationis. Opus conditionis est quo factum est, ut essent quae non erant. Opus restaurationis est quo factum est ut melius essent quae perierant*. PL 176: 183A, 'The materials of all the divine Scriptures, they are the works of the restoration of man. There are two works in which everything is contained and made. The first is the work of creation. The second is the work of restoration. The work of creation is that which was made, so that it may or may not exist. The

described in the book of Genesis, and relates to the physical universe.¹⁸² The *opus conditionis* reflects the three invisible aspects of God – power, wisdom, and goodness (*potentia*, *sapientia*, and *benignitas*) – and out of these three aspects the first, *potentia*, forms the physical creation of the world.¹⁸³

According to Richard, *potentia* becomes apparent in creatures through *immensitas*, which has two elements, *multitudo* and *magnitudo*. *Multitudo* appears in three forms, in likeness, in diversity, and in the mixture of the two, whereas *magnitudo* appears in structure and space (*mole* and *spatio*).¹⁸⁴ Structure (*mole*) is concerned with mass and weight (*pondere*).¹⁸⁵ Space is concerned with '*longus et latus, profundus et altus*' (length and width, depth and height), which describes the three dimensions (especially when we consider that *profundo* and *alto* are interchangeable in the early literature on geometry). For Richard and Hugh God's act of creation reflects the power of God or the Majesty, and at the very foundation of this act of creation is the property of space, and geometric space in particular.¹⁸⁶

Geometry as the basis through which the world was created was expressed in Calcidius' commentary on Plato's *Timaeus*. Augustine compared the opening of Genesis with Plato's *Timaeus*, combining Genesis' description of creation with Plato's discussion of the elements.¹⁸⁷ Later, in the eleventh century at least one manuscript illustrates the relationship between

work of restoration is through that which was made exist becomes better.' Further discussed in Rudolph, *Mystic*, p. 61.

¹⁸² Ibid. II.ii, pp. 114-115.

¹⁸³ Ibid.

¹⁸⁴ Ibid. The geometrical root of this series of relationships is apparent in Richard's use of the term *spatio*, which was reserved for the subject of geometry: Sylla, 'Physics', p. 358.

¹⁸⁵ The scientific basis of this discussion is again apparent in the term *massa*, which was associated with the subject of physics, Ibid.

¹⁸⁶ In Conrad's reconstruction of Hugh's image of the Ark the representation of the *maiestas* is placed at the very top of the image, and shown creating the cosmos through the use of hexameral imagery. Rudolph, *Ark*, p. 102-110.

¹⁸⁷ Saint Augustine, *De Civitate Dei, Libri I-X*, CCSL 47 (Turnhout, 1955), VIII. xi., p. 228.

Plato's four elements and their geometric equivalent.¹⁸⁸ In the previous section on the term *figura* it was noted that Calcidius placed his description of plane figures in the section which considered the creation of the world. Such a worldview was sustained through the Middle Ages and influenced Isidore of Seville's description of the relationship between the four elements in his *De natura rerum*. In order to better illustrate the properties of the elements, Isidore provides a figure, which is captioned, *haec figura solida est secundum geometricam rationem* (e.g. fig. 74).¹⁸⁹ The figure shown is described as a *cybus* ('a cube'), but as Murdoch points out, medieval scribes had 'extraordinary problems' in replicating the figure, with no example of a properly created cube existing.¹⁹⁰ A twelfth- or thirteenth-century English manuscript shows a series of grids with circles, labelled *ennagonus sol* and *eptagonus luna* in the top left and lower right respectively (fig. 74).¹⁹¹ It is clear that *figura solida* are related to *solidus corporis* because they both contain three dimensions; they are both related to the form of perceptible bodies, allowing humans to interact with them.¹⁹²

The criteria for tangible or visible existence for Richard and his contemporaries are the properties of the three dimensions, length, width, and height. Richard discusses dimensional properties in several of his works. One explanation comes in his *De trinitate*, which is Richard's only dogmatic work, and represents an important addition to the corpus of medieval literature on the subject of the Trinity.¹⁹³ In the final chapter of the fourth book Richard questions the

¹⁸⁸ Murdoch, *Albums*, p. 350, illustration 283

¹⁸⁹ This is a solid figure [drawn] according to the rule of geometry.' Isidore, *De natura rerum*, XI, 1. For examples see, Murdoch, *Album*, pp. 280-81, Illustration 247.

¹⁹⁰ Ibid.

¹⁹¹ Laura Cleaver, 'On the Nature of Things: The Content and Purpose of Walters W.73 and Decorated Treatises on Natural Philosophy in the Twelfth Century', *The Journal of the Walters Art Museum*, 68-69 (2010-2011), pp. 21-30, here p. 21.

¹⁹² It is interesting to note that Richard describes his desire for historical accuracy as a desire for a 'solid' foundation, and in the process echoes the language of Isidore in this respect. By definition, only entities with three dimensions can be considered to be 'solid.'

¹⁹³ Richard, *Trinity*, p. 5.

size and location of the legion of demons which have possessed a man (in this case the example at Gethsemane). He writes, 'If we admit that demons have a body, I ask: where were they in that man? [...] We know that all bodies have a length, a width, a height; they have spatial dimensions and they can subsist only in a space containing them.'¹⁹⁴ In presenting the fact that all bodies must, by definition, contain three dimensions, Richard is possibly influenced by earlier works on the subject of dimensions, such as by Gerbert of Aurillac.¹⁹⁵ Instead of inquiring as to the location of the soul, Richard questions the location and nature of demons which inhabit men. He makes no strong conclusion, only that both good and evil angelic spirits must be very small if they are corporeal in nature and are able to fit inside the body of a man. Recalling Aelred's description of his learning process, one that incorporated three methods, *per corpuscula* represented learning through tangible bodies (*corpus solidi*), which must, by definition, possess three dimensions. Richard's conception of perceptible reality incorporated an object which contained three dimensions allowing it to be perceived by the medieval viewer.

Perception was a vital component of gaining knowledge in the twelfth century. During late antiquity sight was given priority over all other senses in its role of experiencing reality, allowing the forms of objects to enter the human mind.¹⁹⁶ Berndt writes that, 'as long as Christ's teaching concerns only exterior things, or his own identity, man is able to verify this

¹⁹⁴ Ibid., p. 167.

¹⁹⁵ As discussed in chapter one, p. 103.

¹⁹⁶ During the Middle Ages there were several theories of how sight worked. Adelard of Bath states that each theory falls into one of four groups. The first states that the mind receives the shapes of 'things' and 'judges them', so that 'nothing from the mind passes to the outside, and nothing from the shapes outside makes its way to the mind.; the second, that the 'shapes of things give shape to the air', and thus become known to the mind; the third, that after a 'visible breath', is projected from the mind, and meets the shapes of things in the air, the information is then returned to the mind by these visible breaths; and finally, a 'fiery force' is produced by the brain, passes through the eyes, to the actual objects of the world, and then returns to the mind.' Grant, *Source-Book*, p. 377. For more information see, Suzanne Conklin Akbari, *Seeing through the Veil: Optical Theory and Medieval Allegory* (Toronto, London, 2004).

teaching by his own experience.¹⁹⁷ This experiential epistemological model can be linked with the experience of early pilgrims to the holy places. In the fourth century, Paulinus bishop of Nola, stated, 'no other sentiment draws men to Jerusalem but the desire to see and touch the places where Christ was physically present.'¹⁹⁸ Frank concludes that 'Christians cultivated a religious epistemology that combined the noblest of the senses (sight) with the most animalistic (touch).'¹⁹⁹ This early medieval prioritisation of sight as a means to knowledge finds an echo in Richard's work during the twelfth century.

Richard's interest in sight reflects the Victorines' learning process which moves from matter to the immaterial, from the perceptible to the imperceptible. Richard defined four modes of seeing, each of which was qualitatively different. Richard's first mode of seeing is concerned only with the 'simple perception of matter;' it is the lowest form of perception because it is divorced from all meaning.²⁰⁰ Madeline Caviness links this first mode of seeing 'to the historical level of Scripture.'²⁰¹ Richard's historical commentary then is related, in his own words, to the 'simple perception of matter.' Indeed the very title, *In visionem Ezechielis*, considers the act of sight as a vital element in the prophet's experience of the Temple complex. Richard's concern for the historical reality of the situation manifests itself in the emphasis he places on the act of seeing, both by the prophet and the medieval reader. Contemporary with Richard's work, the re-discovery of Aristotle's *Metaphysics* in the Middle Ages granted a new emphasis on the importance of sight for experiential knowledge. Aristotle states that, 'sight

¹⁹⁷ Berndt, 'The School', p. 478.

¹⁹⁸ Georgia Frank, *The Memory of the Eyes: Pilgrims to Living Saints in Christian Late Antiquity* (Oxford, 2000). p. 118.

¹⁹⁹ Ibid. p. 132.

²⁰⁰ Madeline H. Caviness, 'Images of Divine Order and the Third Mode of Seeing', *Gesta*, 22 (1983), pp. 99-120, here p. 115. See also, Caviness, 'The Simple Perception of Matter', pp. 48-64.

²⁰¹ Caviness, 'The Simple Perception of Matter', fn. 52.

[...] most of all senses, makes us know.'²⁰² The translation and dissemination of Aristotle's work during the latter part of the twelfth century is one of the defining acts of the twelfth-century renaissance, and plays some part in the emerging interest in the physical universe.²⁰³ Richard's own work and the developing and succeeding consensus in the thirteenth century emphasised the importance of experiential, tangible, and perceptible modes of knowledge, which related information about imperceptible forms.²⁰⁴

The act of measurement which results in the manifestation of a perceptible object which may then be considered and meditated upon is not a phenomenon of Richard's work alone. The measurement of an entity ensures the object may be seen and interacted with. From the twelfth century until the end of the medieval period, metric relics provided an important example of how accurate measurements could be used by the medieval viewer and devotee. Metric relics work by taking a purportedly accurate measurement and mapping it on to 'the local environment.'²⁰⁵ Metric relics rely on the presumption that the measurements are an exact replication of an original location or object.²⁰⁶ For example, in a fifteenth-century commonplace book the author, Humphrey Newton, presented an elongated rectangle inscribed with the statement, 'This mesure within these blakke lynes is the true mesure of the fote of iesu crist as it is enptrynted at seynt georg.'²⁰⁷ About this box Ralph Hanna argues that its purpose was to 'translate holy history into a thoroughly tangible reality, perceptible as

²⁰² The prioritization of the sight in the hierarchy of senses was 'passed down' by Aristotle, Rainer Warning, 'Seeing and Hearing in Ancient and Medieval Epiphany', in Stephen G. Nichols (ed.), *Rethinking the Medieval Senses* (Baltimore, 2008), pp. 102-115, here p. 102.

²⁰³ Bierhoff, *Sight*, p. 65.

²⁰⁴ Cf. Wei, *Intellectual*, p. 39.

²⁰⁵ Rudy, *Virtual Pilgrimages*, p. 97.

²⁰⁶ The phrase 'metric reliquaries' was coined in Jan Pieper, 'Der Garten des Heiligen Grabes zu Götlitz - The Garden of the Holy Sepulchre in Götlitz', *Daidalos*, 58 (1995), pp. 38-43, here p. 41.

²⁰⁷ Oxford, Bodleian Library, MS Lat. Misc. c.66., f. 9v. The manuscript also presents an image of the sacred heart which states that it is an accurate measure of the wounds Jesus suffered on the cross, *ibid.*, f. 129v.

experientially present for the reader.²⁰⁸ Hanna's description of the box echoes this chapter's theory of Richard's text and drawings for his commentary: it provides a reality, it is perceptible, and it takes an object from the past and brings it into the present.²⁰⁹ This concern for metric exactitude appears as early as the twelfth century, when a Byzantine cross was described as equal to the height of Christ.²¹⁰

By precisely measuring an object it was thought the properties of the original objects were imbued into the copy. Lesley Smith writes, 'Churches, such as the Adorno Church in Bruges, were built with identical measurements to the Church of the Holy Sepulchre in Jerusalem; worshippers in these buildings could follow a pilgrimage experience without having to travel to the Holy Land, but deriving the same benefit for their effort.'²¹¹ In this context, the act of transferring one measurement from one place to another place lends itself particularly well to architectural structures. Furthermore, the fact that such measurements were exact forms an important part of the supposed fidelity of such locations. Nicholas of Cusa states, 'Think of precision, for God is absolute precision.'²¹² 'Fidelity' became an important constituent of accurately describing an experience in the later Middle Ages.²¹³ This observation represents a significant leap from Richard Krautheimer's argument that precision was not an important part of architectural iconography, but in the case of verisimilitude and the reconstruction of past and present structures precision was vital.

²⁰⁸ Ralph Hanna, 'Humphrey Newton and Bodleian Library, MS Lat. misc. C. 66.', *Medium Aevum*, 69 (2000), pp. 279-91.

²⁰⁹ It can be noted that Newton states that the measurement is 'true', part of Richard's aim when writing *In visionem Ezechielis*.

²¹⁰ Rudy, *Virtual Pilgrimages*, p. 98.

²¹¹ Smith, *The Ten Commandments*, p. 54.

²¹² Nicholas of Cusa, *The Layman on Wisdom and the Mind*, trans. M.L. Fuehrer (Ottawa, 1989), p. 41.

²¹³ Rudy, *Virtual*, p. 39.

Imagination and Geometry

This section explores the importance of imagination in the formation of a geometrically-founded reality. The imaginative faculty provided the first step in determining the appearance of historical objects, such as those described by Ezekiel, and, for the purposes of my argument, it is important to recognise that in the twelfth century the imagination and its role in uncovering knowledge was very different from today. Imagination provided the raw material to create the objects of the past which could be used in a commentary like Richard's. In Victorine works 'readings begin with the visible world of words and things and their literal understanding.'²¹⁴ It is for this reason that Hugh begins his *Mystic Ark* with the literal and historical description and image of Noah's ark. The relationship between 'text and reality' is manifest in the word (*vox*) and the 'referent in the visible world (*res*).'²¹⁵ Part of Richard's purpose is to bring the imperceptible structures of Ezekiel's experience into a framework which creates a real object, an entity of the visible world, namely a *res*. He attempts to bring the literal and historical *res* into the visible realms, removing the barriers of time and space so the twelfth-century reader may experience Ezekiel's vision as accurately as possible.²¹⁶

The past is inherently impossible to experience directly; it may only be encountered via indirect means.²¹⁷ The invisible nature of the past requires any reconstruction of it to make it directly perceptible to the reader. During the Middle Ages imagination was not thought of as the nebulous and unreliable faculty it is today, but a necessary tool allowing one to gain knowledge of the universe.²¹⁸ The imagination acted as a medium between visible and

²¹⁴ Coulter, *Visibilia*, p. 61.

²¹⁵ Ibid.

²¹⁶ Coulter distinguishes between *voces* and *res*, words and things. Ibid., p. 62.

²¹⁷ The following chapter will examine contemporary ideas of time and the past's relationship with the present in detail.

²¹⁸ Smith, 'Jews and Christians', p. 112.

invisible realities. The apostle Paul writes, 'For the invisible things of him from the creation of the world are clearly seen, being understood by the things that are made.'²¹⁹ Paul's statement underlines the Christian view of creation as being imbued with both visible and invisible material. The imperceptible nature of the invisible realm is mediated to humans through the visible things of the world which contain some hint of what one cannot see.²²⁰ The identification of these two realities arises out of the Neoplatonic Christian thought which informs much of Augustine's work, and becomes mediated through the Middle Ages by him.²²¹ One of the fundamental concepts underpinning Augustine's Platonism determines the order of the universe which is expressed in the relationship between the visible and invisible realms.²²² For Augustine true reality was the intellectual or intelligible realm, one which did not only encompass the mundane or perceptible reality.²²³ Man's image and likeness to God is 'correctly understood according to what is within man and is his principal part, that is, according to the mind.'²²⁴

It is worth considering the manner in which Richard approaches the prospect of building a world, and the role imagination has within that context. First, we can trace the role of imagination in gaining knowledge of the medieval world; second, we can relate the role of imagination in this regard to Nelson Goodman's theory of worldmaking, which is explained below. We will see that these two facets of creating *In visionem Ezechielis* are not mutually exclusive, and that Richard's theory of imagination inherently imbues the imaginative act with

²¹⁹ Rom. 1. 20, *invisibilia enim ipsius a creatura mundi per ea quae facta sunt intellecta conspiciuntur sempiterna.*

²²⁰ Jacques Le Goff, *The Medieval Imagination*, trans. Arthur Goldhammer (Chicago; London, 1988), p. 5.

²²¹ A.H. Armstrong, *St. Augustine and Christian Platonism* (Villanova, Pa., 1967).

²²² M.-D. Chenu, *Nature, Man and Society in the Twelfth Century: Essays on New Theological Perspectives in the Latin West*, trans. Jerome Taylor, Lester K. Little (London, 1997), p. 62. Augustine writes, 'Thus all of creation, whether intellectual or corporeal – or, as we can but it more briefly in the words of divine Scriptures, whether invisible or visible – has been made by God.' Augustine, *The Fathers of the Church: St. Augustine on Genesis*, trans. Roland J. Teske, S.J. (Washington D.C., 1991), p. 146.

²²³ Chenu, *Nature*, p. 62.

²²⁴ Augustine, *On Genesis*, p. 186.

a sense of creation. The purpose behind this action embraces the view that images can convey information which otherwise would be difficult to do with the written word, and that the creation of those images depend upon elements from the primary world, i.e., Richard's immediate environment.

The role imagination plays in the process of understanding imperceptible entities proposes that the forms of objects, their general appearance, acts as a catalyst to understand the inner, imperceptible, nature of those objects. Van t'Spijker underlines the importance of imagination in this process: 'the *similitudines* with which alone one can express the realm of knowledge of the invisible, in their character as images and *figurae*, are necessarily bound to the work of imagination, betraying an ineradicable attachment to the reality which the reader seeks to transcend.'²²⁵ This comment underlines the use of figures as a means to express what was imperceptible. Accordingly, the only way of interacting with nature is through forms or likenesses (*similitudines*); it is an inherent part of man's interaction with the world. Augustine characterises this movement as three types of vision – corporeal, spiritual, and intellectual – which have already been discussed in the first chapter.²²⁶

Raymond DiLorenzo observes that 'Richard's general assessment of imaginative activity [is] surprisingly positive.'²²⁷ Richard writes at length about the importance of imagination for the development of wisdom, using a complicated allegory in his *Benjamin minor*, which has been frequently consulted for medieval theories of imagination.²²⁸ This work

²²⁵ Ienje van t'Spijker, *Fictions of the Inner Life: Religious Literature and Formation of the Self in the Eleventh and Twelfth Centuries* (Turnhout, 2004), p. 149.

²²⁶ Saint Augustine, *Sancti Aureli Augustini De Genesi Ad Litteram Libri Duodecim Eiusdem Libri Capitula*, edited by Joseph Zycha, CSEL 25 (Vienna, 1894), 12.11., p. 392. This will be discussed in more detail in the following chapter.

²²⁷ Raymond DiLorenzo, 'Imagination as the First Way to Contemplation in Richard of St. Victor's *Benjamin Minor*', *Medievalia et Humanistica*, 11 (1982), pp. 77-91, here p. 77.

²²⁸ Michelle Karnes, *Imagination, Meditation, and Cognition in the Middle Ages* (Chicago, 2011), p. 27. Also, Lodi Nauta, et al. (eds.) *Imagination in the later Middle Ages and Early Modern times* (Leuven, 2004).

presents the story of Jacob and his twelve children, using the narrative, characters, and story as allegorical figures detailing the development of human knowledge which is pointed towards the invisible.²²⁹ Bala, who is the handmaiden of Rachel, represents imagination, and acts as a mediator between her mistress Rachel (who is the personification of illuminated reason) and the 'carnal sense' which is embodied by Rachel's sister Lia.²³⁰ In this work Richard describes six types of contemplation which are hierarchically arranged from worse to better, the first three of which involve the use of imagination. These are 'imagination and according to imagination, in imagination according to reason, in reason and according to imagination.'²³¹ According to this hierarchy of contemplation imagination is assigned to the initial place, and 'teaches one to devalue earthly things and rise above them.'²³² As this hierarchy proceeds upwards, imagination is dispensed with, to the point at which it is no longer needed; indeed it begins to hinder one's progress.²³³ For Richard then, 'imagination is the means of concourse between sense and reason.'²³⁴ Also, imagination holds the raw resources of sensory experience, a vestige of an object's *forma* which resides in the memory.²³⁵ Richard hints at this relationship in *In visionem Ezechielis*, writing, '*Cum enim mystici sensus ex earum congrua*

²²⁹ Richard of St. Victor, *Benjamin Minor*, edited by S.V. Yankowski (Ansbach, 1960).

²³⁰ *Accepit ergo utraque illarum ancillam suam. Affectio, sensualitatem; ratio, imaginationem. Obsequitur sensualitas affectioni; imaginatio famulatur rationi.* 'Each of the two wives has received a female servant: affection has sensual perceptions as her handmaid, reason has imagination.' Richard, *Benjamin Minor*, p. 20.

²³¹ DiLorenzo, 'Imagination', p. 84. *Benj. Min.* chap. V. The final three are: 'In reason and according to reason, above reason but not excluding reason, and above reason and even excluding it.' Richard, *Benjamin Minor*, p. 20.

²³² Karnes, *Imagination*, p. 27.

²³³ Although imagination is never truly dispensed with. Richard recognises its continuing importance in one's life.

²³⁴ DiLorenzo, 'Imagination', p. 84.

²³⁵ This conception of the relationship between sense and imagination broadly reflects accounts slightly later than Richard's, which envisaged the brain having three compartments, 'the first being *ymaginativa*, where things which the exterior senses perceive 'are ordered and put together; the middle chamber is called *logica*, where the power of estimation is master; and the third and last is *memorativa*, the power of remembrance, by which things which are apprehended and known by imagination and reason are held and preserved in the treasury of memory.' Taken from A. J. Minnis, 'Medieval Imagination and Memory', *Cambridge History of Literary Criticism* (9 vols., Cambridge, 2005), II., pp. 237-274, here p. 237.

*rerum similitudine eruantur atque formentur.*²³⁶ Here Richard creates an explicit link between the *similitudines*, the form of object, and its relationship with the imperceptible elements of the universe, in this case characterised by the mystical sense of Scripture.

Richard narrowly focuses on the historical *disciplina*, eschewing allegory and tropology, *disciplinae* which are more explicitly concerned with invisible things.²³⁷ By attempting to relate the past to the viewer in a direct manner Richard was forced to incorporate the experience, the 'raw resources of sensory experience,' as mentioned above. The allegorical interpretation of Ezekiel's vision dominated contemporary works, and especially the *Glossa ordinaria*. For example, the biblical text which describes the brazen man in further detail reads, '*et ecce murus forinsecus in circuitu domus undique et in manu viri calamus mensurae sex cubitorum et palmo et mensus est latitudinem aedificii calamo uno altitudinem quoque calamo uno.*'²³⁸ The associated gloss reads, '*in quibus activa vita,*' and '*Scriptura sancta in qua omnem vitae nostrae actionem metimur.*' a reading associated with Gregory the Great.²³⁹ In this sense the rod which Ezekiel's guide holds signifies the nominal measurement through which one may account for their life, the structures of Ezekiel's Temple only become apparent, and hence real to the reader, through their measurement.

For Richard, *calamus* may also hold a literal meaning, as the pen with which he writes his own words.²⁴⁰ Interpreted in this manner Richard's role as author is reflected in the activity of Ezekiel's guide who describes the exact appearance of the buildings. Richard illustrates the appearance of these buildings with his own *calamus*, or pen, demonstrating to the reader the

²³⁶ 'for the mystical senses, they are taken from these things agreeing with the likeness and they are formed.'

²³⁷ Allegory and its structures will be discussed in more detail in the following chapter.

²³⁸ 'And behold there was a wall on the outside of the house round about, and in the man's hand a measuring reed of six cubits and a handbreadth: and he measured the breadth of the building one reed, and the height one reed.' Ez 40:5.

²³⁹ 'In which things are the active life', and 'Holy Scripture that by which we measure every action in our lives.'

²⁴⁰ R.E. Latham, *Dictionary of Medieval Latin from British Sources*, fasc. II, C., (London, 1981), p. 241

historical appearance of the buildings. Richard re-creates the vision by re-building the world of Ezekiel's experience, doing so by means of the imagination, the images which he provides in almost complete detail create a 'true' reality in one's mind. Chase writes, 'Richard, casting himself in the role of exegete, might be taking his cue from Scripture itself, seeing himself as the man 'with a linen cord and measuring reed in his hand.'²⁴¹

John of Damascus explains the usefulness of images, writing, 'man [cannot] have immediate knowledge of things which are distant from each other or separated by place, because he himself is circumscribed by place and time.'²⁴² As mentioned, Richard assigns imagination as one element in contemplation, but it remains to be seen what exactly should be contemplated, and why. Forms and objects which fall into the category of 'invisible' are not only imperceptible concepts such as the soul, as we have seen in the first chapter, but may be more prosaic objects such as different times and places. Wanda Cizewski underscored this point when she quoted Hugh of Saint Victor, 'for the whole sensible world is like a kind of book written by the finger of God – that is, created by divine power - and each particular creature is somewhat like a figure, not invented by human decision, but instituted by the divine will to manifest the invisible things of God's wisdom.'²⁴³ For Hugh and Richard each created object is 'somewhat like a figure' taking on the form which God granted it, and may be understood via its form.²⁴⁴ Through the contemplation of and meditation on these forms one may come to understand the invisible nature of the object.²⁴⁵ The driving force behind

²⁴¹ Steven Chase, *Angelic Wisdom: The Cherubim and the Grace of Contemplation in Richard of St. Victor* (Notre Dame, 1995), p. 11.

²⁴² John of Damascus, *On the Divine Images: Three Apologies against those who Attack the Divine Images*, trans. Andrew Louth (Crestwood, N.Y, 1980), III. 17., p. 74.

²⁴³ Wanda Cizewski, 'Reading the World as Scripture: Hugh of St Victor's *De Tribus Diebus*', *Florilegium*, 9 (1987), pp. 65-88, here p. 70.

²⁴⁴ Ibid.

²⁴⁵ Cf.. In his *De tribus diebus*, Hugh writes, 'But in the same way that some illiterate, it he saw an open book, would notice the figures but would not comprehend the letters, so also the stupid and 'animal man' who 'does not perceive the things of God.' Ibid., p. 70.

Victorine teachings, especially for the novices whose ultimate purpose was the vision of God, is the movement from visible to invisible.²⁴⁶

Worldbuilding and Creation

In order to demonstrate that Richard's perception of imagination includes the act of creating a 'real' object, it must be possible to relate the imaginative act to the act of creation; we must identify Richard's historical models as an act of worldmaking. To demonstrate Richard's transition from invisible to visible, several elements must be explained. Mary Carruthers' view of the relationship between Richard's diagrams and reality as memory aid has been shown to fall short of explaining Richard's work, and Cahn's formalistic comparisons between Richard's drawings and contemporary architecture fail to explain the immediate context of *In visionem Ezechielis*. Instead, I propose that by interpreting the diagrams and text as a symbolic system which attempts to convey knowledge by means of cognitive imagery much of what appears in *In visionem Ezechielis* may be explained.

Worldmaking as a structural model appeals to the work of Nelson Goodman. Goodman focuses on the clarification of systems of representation within works of art, and later in his career he developed a series of criteria for analysing acts of worldmaking in representational and descriptive contexts.²⁴⁷ One advantage of using Goodman's work is the comprehensiveness of its application, providing insight into scientific diagrams and notation as much as art historical or figurative images.²⁴⁸ One facet of this worldmaking explicitly

²⁴⁶ Coulter, *Visibilia*, p. 18.

²⁴⁷ Much of Goodman's work on the subject of worldbuilding can be found in Nelson Goodman, *Ways of Worldmaking* (Indianapolis, 1978).

²⁴⁸ 'Instead of pitting the arts, the humanities, and the sciences against each other, such an approach provides a useful framework for comparatively exploring similarities and differences with regard to their respective forms of worldmaking.' in Ansgar Nünning, Vera Nünning, 'Ways of Worldmaking as a Model for the Study of Culture: Theoretical Frameworks, Epistemological Underpinnings, New Horizons', in Vera Nünning, *et al.* (eds.), *Cultural*

concerns architecture; indeed Goodman's work has been specifically highlighted for its associations with architectural theories, and the importance of architecture as one aspect of worldmaking.²⁴⁹ Goodman was also aware that his theories apply to a wide spectrum of media including architectural representations.²⁵⁰

Goodman's theory of worldbuilding attempts to describe how authors, artists, and scientists construct 'symbol systems' which are used as the building blocks for alternative worlds which inherently affect how they are conveyed to the reader or viewer.²⁵¹ These other worlds may be literary, scientific or visual in nature. The pertinence of Goodman's systematic approach to symbol systems lies the range of sources to which it can be applied. Goodman is at pains to diminish the differences between the sciences and the arts.²⁵² This re-conception of two fields of knowledge which acknowledges the similarities between their symbolic systems is possible because both use images and diagrams as a symbolic system acting as a cognitive tool. Nünning writes, 'underlying this approach is Goodman's belief in the cognitive nature of art, which invites consideration of the arts as partners with the sciences in the pursuit of understanding.'²⁵³ In essence Goodman advocates the ability of an image to demonstrate and mediate knowledge. Any earlier doubts regarding this relationship stem from assumptions made about the immediate context and field of knowledge in which the image appears. For instance, Goodman points out that the diagram provided by a 'momentary

ways of worldmaking: media and narratives (Berlin; New York, 2010), pp. 1-25, here p. 19. An example of how Goodman transcends boundary disciplines will be discussed below.

²⁴⁹ Remei Capdevilla-Werning, *Goodman for Architects* (London, 2013).

²⁵⁰ Nelson Goodman, 'On Capturing Cities', *Journal of Aesthetic Education*, 25 (1991), pp. 5-9, here p. 5.

²⁵¹ Nünning and Nünning, 'Ways of Worldmaking', p. 7.

²⁵² E.g., 'The difference between art and science is not that between feeling and fact, intuition and inference, delight and deliberation, synthesis and analysis, sensation and cerebration, concreteness and abstraction, passion and action, mediacy and immediacy, or truth and beauty, but rather a difference in domination of certain characteristics of symbols.' Nelson Goodman, *Languages of Art: an Approach to a Theory of Symbols* (London, 1969), p. 264.

²⁵³ Nünning and Nünning, 'Ways of Worldmaking', p. 19.

electrocardiogram' and a 'Hokusai drawing of Mt. Fujiyama' could be very similar in their outline; only the restrictive context applied to our understanding of a diagram distinguishes one from the other. In such a diagram 'The thickness of the line, its colour and intensity, the absolute size of the diagram, etc., do not matter.'²⁵⁴ This may not even be intentional, however: 'myth, art, language, and science are thus symbols not in the sense of mere figures that refer to some reality by means of suggestions and allegory, but in the sense of agents each of which produces and posits a world of its own.'²⁵⁵ With this statement Goodman argues for the necessity of communicating via a symbol system, or a combination of two or several systems, which inherently creates alternative worlds.

We have seen that Carruthers addresses the potential reality of Richard's images in relation to their role as a cognitive image, and she implies that this is to the detriment of Smalley's scientific argument.²⁵⁶ Neither Carruthers' nor Smalley's models comfortably accommodate Richard's work; Carruthers never fits the images into the mnemonic framework satisfactorily, and Smalley does not determine why such diagrams appear in Richard's work in particular. Instead, by incorporating Goodman's analysis of symbol systems it becomes possible to identify Richard's text and images as both cognitive tool and, in a sense, real. Nünning notes that the use of images and diagrams in both the arts and sciences provide a set of 'cognitive tools,' which ultimately derive from nature.²⁵⁷ This facet of Goodman's outline of symbolic systems as cognitive models aligns with Richard's objectives when writing *In visionem Ezechielis*.²⁵⁸ Applying Goodman's work in this manner agrees with Carruthers'

²⁵⁴ Nelson Goodman, *Languages*, p. 229.

²⁵⁵ Goodman, 'Capturing Cities', p. 8.

²⁵⁶ Previously Carruthers states that 'images for thinking are not primarily useful because of their objective truth content or their mimetic ability: they have none, or have it at best incidentally.' Carruthers, *Craft*, p. 120.

²⁵⁷ Nünning and Nünning, 'Ways of Worldmaking', p. 19; Cf. Curtis L. Carter, 'A Tribute to Nelson Goodman', *Journal of Aesthetics and Art Criticism*, 58 (2000), pp. 251-53, here p. 252.

²⁵⁸ Namely Richard's concern for a solely historical understanding of the book of Ezekiel.

suggestion that Richard's work may be used as a cognitive model, in the sense of Hugh of Saint Victor's or Adam of Dryburgh's description of architectural structures. It also allows for the scientific and exact nature of Richard's work to be analysed and explained in terms of their reality, and especially the emphasis Richard places on understanding the structures he describes as three-dimensional objects.

Goodman highlights the potential relativity in the creation of worlds, and the subjectivity involved in experiencing these worlds, but he is primarily concerned with the processes and relationships which cause worlds to be made. Worlds are not created *ex nihilo*, but 'worldmaking [...] always starts from worlds already on hand; the making is a remaking.' Here Goodman aims to explore the processes involved in building a world out of others.²⁵⁹ The primary method through which these new worlds are created from the primary world is the reorganisation of patterns within the alternative world, and representing them in a different context or configuration.²⁶⁰ Goodman's model of creation (and hence the design of a cognitive image), has five criteria: composition and decomposition; weighting; ordering; deletion and supplementation; and deformation.²⁶¹

Richard's borrowing from the primary world (i.e., his environment) is evident from Cahn's comparison of the architectural forms in *In visionem Ezechielis* with contemporary Romanesque styles. Richard has taken particular architectural elements and their forms and used them to build the structural appearance of his buildings. This is most apparent in the elevation drawings. For example, Richard presents the arches of each building as semi-circular forms; the artist of Oxford, Bodleian Library, MS Bodl. 494, ff. 150v and 151r (figs. 71-72) was careful enough to use a compass for each of the arches, as indicated by holes in the parchment

²⁵⁹ Goodman, *Ways*, p. 6.

²⁶⁰ Nünning and Nünning, 'Ways', p. 8. Also, Goodman, *Ways*, p. 22.

²⁶¹ Goodman, *Ways*, pp. 7-17.

at the centre of each arch.²⁶² While Romanesque architecture is not synonymous with round arches it does indicate simply that Richard borrowed recognisable elements of the structures readily visible so the contemporary reader could make sense of the forms. Carruthers also acknowledges the importance of using contemporary and recognisable forms in image-making for cognitive purposes.²⁶³ Richard makes reference to the world around the reader, attempting to bring elements of the primary world into the framework of the Temple, writing, 'The ascending path with steps of this style, we see in the common curving circuit through which towers ascend, and in the high buildings of this kind.'²⁶⁴ The primary world provides architectural elements which can be rearranged to form an overall image which conforms to Richard's recreation of Ezekiel's Temple.

Goodman's five criteria broadly echo medieval interpretations of the proper creation of objects, although there are, of course, different emphases. Hugh of Saint Victor describes three criteria for the creation of good architecture, *In omni aedificatione tria sunt praecipue consideranda, ordo, dispositio et definita dimensio, habens principium et finem determinatum*.²⁶⁵ Order, layout and knowledge of the particular dimensions of a structure are the most important aspects of building a structure for Hugh. In the case of *The Moral Ark* Hugh details how one should build an Ark within oneself, and goes on to examine the role of *ordo* in this regard.²⁶⁶ Vitruvius refers to somewhat similar tripartite criteria for architecture, *firmitatis, utilitatis, and venustatis*; however, the differences between Hugh's and Vitruvius' criteria would

²⁶² This is only the case on the larger arches, for example those for the top and second floor of the lateral elevation of the north gatehouse. The smaller arches for the ascending arcade on the ground floor are drawn freehand.

²⁶³ Carruthers, *Craft*, p. 239.

²⁶⁴ *Hujusmodi viam gradibus ascendentem, et se in gyrum flectentem videmus quotidie in ascensionibus turrium, vel ejusmodi sublimium aedificiorum*. PL 196: 584B

²⁶⁵ 'In every building there are three things which ought chiefly to be considered, order, layout, and certain dimensions, having determined the beginning and end.' Rudolph, *Mystic*, p. 245.

²⁶⁶ Conrad Rudolph does not offer more information on the categories of *dispositio* and *definita dimensio*, Vitruvius also formed a famous tripartite set of criteria for creating architecture – durability, utility, and delight.

imply that the former was not influenced by the latter in this regard, despite both discussing architecture.²⁶⁷

Instead, Theophilus' (fl. twelfth century) work *De diversis artibus* demonstrates how different liturgical objects, such as pictures and metalwork objects, are constructed, providing a relatively large amount of detail on the subject.²⁶⁸ In the preface for book three Theophilus writes, '*Per spiritum intellectus cepisti capacitatem ingenii, quo ordine qua varitate qua mensura vaeas insistere diverso operi tuo.*'²⁶⁹ There are two important aspects to this statement. First, Theophilus places this section as the second part of a sevenfold system of taking action through the Spirit.²⁷⁰ This means of creation through the Spirit of God mirrors the opening of book one, which begins with an account of the creation of the world.²⁷¹ This section considers the act of understanding through which one 'receives the capacity for skill.' This facet of the Spirit reflects Richard's own aims to enable the reader to understand especially through the historical sense which Richard exclusively provides.²⁷² Second, Theophilus' criteria of understanding through the creative act (*ordine, varitate, mensura*) bear resemblance to Hugh's own criteria for creation (*ordo, dispositio et definita dimensio*), which Richard would have known. Theophilus' *ordo, varietas*, and *mensura* differ, however, from the physical properties of *mensura, numerus*, and *pondus* that guided the creation according to the Wisdom of Solomon. It might be argued that it was 'precisely the capacities for order, variety, and

²⁶⁷ Vitruvius, *De Arch.* I.iii., p. 35. It seems likely that Hugh would have been aware of Vitruvius' work; at least one manuscript St. Victor, although it has been subsequently lost: Ouy, *Les Manuscrits*, p. 509.

²⁶⁸ Scholars have suggested that Roger of Helmerhausen is the author of the *De diversis artibus*, but it is only known that he flourished at approximately the same time that the work was written. Theophilus, *The Various Arts De Diversis Artibus*, trans. C.R. Dodwell (Oxford, 1986), pp. xl-xliv.

²⁶⁹ 'Through the spirit of understanding, you have received the capacity for skill – the order, variety and measure with which to pursue your varied work.' Ibid., III. preface, p. 62.

²⁷⁰ In order these are: the spirit of wisdom, the spirit of understanding, the spirit of counsel, the spirit of fortitude, the spirit of knowledge, the spirit of godliness, and the spirit of fear of the Lord. Ibid.

²⁷¹ Ibid., I. preface, p. 1.

²⁷² *etiam juxta historicum sensum, ex ipsa poterimus congruum intellectum eruere.* 528A 'For it is according to the historical sense, from which we will be able to derive a suitable understanding.' See also 541B.

measure that enables the medieval craftsman to select artistic compositions which were geometrically organized in varying degrees.²⁷³ The implication is that geometrically organised compositions and objects were related to the creative act during the twelfth century, at least in the case of Theophilus, but also for Richard as well.

Finally, Goodman provides a model definition of truth in the case of worldmaking. He writes that, 'a version [of a world] is taken to be true when it offends no unyielding beliefs and none of its own precepts.'²⁷⁴ Goodman's claim to truth reflects Richard's aims, as we have seen above, but which is apparent as Richard writes, '*Sed tu vis honorare, et defendere veterum auctoritatem, sed nunquam verius honoramus veritatis amatores, quam quaerendo, inveniando, docendo, defendendo, diligendo veritatem.*'²⁷⁵ For Richard historical truth is apparent in an understanding of Scripture which does not contradict the text itself, as evidenced in the grammatical approach taken. Also, Richard explicates truth using the same system the prophet did, by the measurement of the structures, marking them out section by section. For example, to illustrate the appearance of the entire complex Richard proceeds from the general to the more detailed. Figure 56 illustrates the image Richard uses to describe the outermost walls and their spatial relationship with the structure in the centre, indicated by the *titulus, atrium interius*. Following this Richard describes the structures that surround the central part of the complex, which is illustrated with the *atrium interius* still placed in the centre (fig. 57). Finally Richard completes this description by including an illustration of the building east of the central atrium with a larger more detailed plan (fig. 58). The overall effect is one which magnifies particular structures, leading the reader and viewer to understand the buildings'

²⁷³ Caviness, 'Images of Divine Order', p. 115.

²⁷⁴ Goodman, *Ways*, p. 17.

²⁷⁵ 'But you wish to honour and to defend the old authority, but we never more truly honour the lovers of truth, than by searching, discovering, teaching, defending, and loving truth more dearly.' PL, 196: 562B

appearance piece by piece.²⁷⁶ As a result the reader is left with a sense of internal consistency and truth within Richard's recreation, as he consistently supports his argument with a system of plans and architectural representations which reflect the textual process of revealing the necessary information in a piecemeal but systematic manner.

Goodman's model for worldmaking allows us to place Richard's *In visionem Ezechielis* into a framework which best explains its elements. Primarily, Richard is concerned with discovering and communicating truth to the reader. In order to do this he is faced with the underlying problem that he must take the structures Ezekiel describes and present them to the reader as if they were present in front of him. Medieval cognitive models allowed for this to happen only in the sense that the imaginative faculty took elements of the primary world, re-set them, and then re-presented them in a non-contradictory way. Richard achieves this by means of relying on contemporary criteria for understanding and creation: order, disposition, and clear measurement. Richard's act of worldmaking takes specific advantage of contemporary theories of the imagination to draw the invisible world into the realm of the visible.

Conclusion

Richard Krautheimer judged that, 'This inexactness in reproducing the particular shape of a definite architectural form, in plan as well as in elevation, seems to be one of the outstanding elements in the relation of copy and original in mediaeval architecture. Indeed it recalls a well-known phenomenon, the peculiar lack of precision in mediaeval descriptions not only of architectural patterns but of all geometrical forms.'²⁷⁷ Krautheimer charts a change in this

²⁷⁶ Cahn, 'Architecture and Exegesis', p. 58.

²⁷⁷ Krautheimer, 'Introduction', p. 7.

approach to architectural forms which happens during the thirteenth century, and was presumably marked by the growing exactitude we find in architectural representations and technical drawings at that time.²⁷⁸ Richard of Saint Victor's drawings, however, are founded in and rely on an exactitude of approach as the only way to confer a sense of reality and 'truth' upon the drawings. Richard is hindered by the lack of technology and strict training such as would be required of the later architects or university masters; however, it is in his work that we find the impetus to change from this 'inexactness' to a more accurate representation of the past, and hence reality.

The ultimate aim of Richard's work is to create a verifiable and 'true' construction, one which the prophet Ezekiel could actually have seen. To carry out this aim Richard meticulously measures each building for the viewer, creating an accurate sense of the past. Richard relies on the medieval scientific consensus which identified geometry as one formative tool in the creation of the universe; the act of measuring the buildings so precisely makes use of contemporary geometry. Goodman's model of worldmaking provides an effective structure for contextualising Richard's approach. Goodman's theory helps to explain Richard's use of both text and image for creating a cognitive tool and form of proof for his theories. Geometry provides the building block for this proof, demonstrated by Richard's use of geometric language and image. Geometry was conceived of as the root of God's creative power of perceptible material Richard borrows this to re-create the world of the prophet. The absolute three-dimensional quality of Richard's creation is vital when creating this sense of reality, and points towards the thirteenth-century trend toward a metric-based approach used by scholars when studying the universe. The final stage in Richard's work is to provide a perceptible vision

²⁷⁸ As discussed in relation to Villard de Honnecourt's portfolio, but also in relation to legal documents as discussed in Toker, 'Gothic Architecture', pp. 67-95.

of the past, one which relates to the 'simple perception of matter.' However, there is nothing simple in how Richard represents his exact measurements; indeed, his work pre-dates developments in technical drawing by nearly fifty years. By doing so, Richard re-creates the past with great accuracy and, as a result, in a very persuasive manner.

Chapter Three – Architectural Temporality in Four Dimensions

Introduction

'It is hoped that an exhaustive investigation will someday be made with the intention of showing in a particular historical society the interaction between objective structures and mental frameworks [...], between the various times within Time. This would help to shed light on the very substance of history.'¹ Le Goff's desideratum highlights two important points which will be discussed in this chapter. First, that time is a 'mental framework,' one which interacts and helps explicate 'objective structures,' such as architecture. Second, that time is not a single entity which can be described easily; instead it is constructed of a series of smaller parts which are arbitrary in measurement, such as the minute, hour, day or year, each of which were thought to reflect the construction of the cosmos by God.² We can interpret the term 'objective structures' in two ways: first, as a reference to material structures, a definition encompassing material culture; second, as referring to institutional structures, such as the liturgy. This chapter explores both these interpretations, each of which allows the medieval student to move conceptually back and forward in time by the use of contemporary material culture. By this I mean the student interprets their environment by means of non-literal exegesis; and of allegorical and typological exegesis in particular. The importance of this approach lies in its articulation of a dynamic view of architecture, and its representations. Structures, material or otherwise, are not static entities that, once built, remain unchanged; instead they develop and evolve over time in tandem with communities or 'a particular

¹ Jacques Le Goff, *Time, Work & Culture in the Middle Ages* (Chicago; London, 1980), p. 38.

² Rory Fox, *Time and Eternity in Mid-Thirteenth-Century Thought* (Oxford, 2006), pp. 23-41. Fox identifies ten different temporal terms, and discusses the problems of differentiating between them. Medieval works on time enumerate the different measurements for time, see, *Bede: On the Nature of Things and on Times*, trans. Calvin B. Kendall and Faith Wallis (Liverpool, 2010), pp. 107-112.

historical society.’ To this end, the work of Honorius Augustodunensis and the emphasis he places on objects in his work provides an excellent resource to determine how architecture and time elide in medieval education. Honorius’ work best illustrates the relationship between time and architecture because of his extended discussion of the church building which is relatively rare in the twelfth century. As we will see, this work influenced a number of later texts, which implies that Honorius’ approach was deemed to be successful. For that reason Honorius, and his *Gemma animae* especially, is included as a case study in this thesis.

Honorius created a large amount of didactic material, reflecting the main trajectory of his career as a teacher, but here we will concentrate on his *Gemma animae*. I intend to highlight Honorius’ ‘love of viewpoints’ and extensive use of medieval material culture throughout his teaching texts.³ Such ‘didactic materialism’ illustrates the importance of objects in the teaching process, creating tangible links with abstract disciplines, such as theology.⁴ In keeping with the dimensional approach of the thesis I shall first discuss how the fourth dimension – time – was understood by some authors in the twelfth century. By doing so, it can be demonstrated that time inserted a dynamic component into the interpretation of the ‘institutional structures’ of the time. To better understand the term ‘didactic materialism’ I shall next present Honorius’ allegorical exposition of the rite of dedication for the medieval church, which appears in the *Gemma animae*, as an attempt to use the church building as a pedagogic instrument. The liturgy, as it appears in the dedication rite, provides a discrete event for the student to learn about history, and especially the passion of Christ. Finally, it will be possible to illustrate that a temporal model was used as an organisational principle in Honorius’ *Gemma animae*, more specifically in the description of the church moving from east

³ V.I.J. Flint, ‘Heinricus of Augsburg and Honorius Augustodunensis: Are They the Same Person?’, *Revue Bénédictine*, 92 (1982) pp. 148-58, at p. 151.

⁴ I shall explain what I mean by the term ‘didactic materialism’ below, pp. 225-239 (FIX)

to west, following the longitudinal and commonly accepted temporal line of the church building.

Before focusing on Honorius, however, we need to provide an overview of typological exegesis and its development, because typological models of reading were bound up with concepts of time. Whereas allegorical exegesis encompasses a broad range of non-literal readings of Scripture, typological exegesis focuses on the relationship between the Old and the New Testaments. Typological and allegorical exegesis provide Honorius with a methodology which allows him to incorporate time into readings of contemporary material culture, including architecture. Saint Paul uses allegory (*allegoria*) in his description of the early Church, likening Hagar, the slave by whom Abraham fathered Ishmael, to a person born in bondage, and Isaac, his son by his wife Sara, as 'the children of promise.'⁵ Allegory, then, as a means to understand and interpret Scripture is present even in the Bible itself.⁶ As a result it has an inherent value in its application to Scripture. John Cassian (d. 435) enumerated fruitful exegetical approaches in his *Conferences*.⁷ In this work he outlines two types of knowledge, practical and theoretical. The latter is divided into two parts, one of which encompasses three modes of exegesis; historical, allegorical, and tropological.⁸ In the twelfth century, Hugh of Saint Victor used an architectural image to describe what allegory is.⁹ First he asks the reader

⁵ 'Now this is an allegory: these women are two covenants. One woman, in fact is Ha'gar, from Mount Sinai, bearing children for slavery. Now Ha'gar is Mount Sinai in Arabia and corresponds to the present Jerusalem, for she is in slavery with her children. But the other woman corresponds to the Jerusalem above; she is free, and she is our mother [...] Now you, my friends, are children of the promise, like Isaac. But just as at that time the child who was born according to the flesh persecuted the child who was born according to the Spirit, so it is not also.' Gal. 4.24-29.

⁶ Henri de Lubac cites a quatrain in which the allegorical sense of literature is described: 'The allegorical is said to be the part that is played amid the long-lost shadows.' See Henri De Lubac, *Medieval Exegesis*, trans. Mark Sebanc (2 vols., Grand Rapids, Mich.; Edinburgh, 1998), I., p. 2.

⁷ John Cassian, *The Conferences*, trans. Boniface Ramsey (New York, 1997).

⁸ Ibid., p. 510; 14.VIII.5. Here Cassian defines allegory as that 'by which the things that historical narrative conceals are laid bare by a spiritual understanding and explanation.'

⁹ Mayeski, 'Early Medieval Exegesis', pp. 86-112.

to envision a complicated structure with different stone courses; he then writes, 'The foundation which is under the earth we have said stands for history, and the superstructure which is built upon it we have said suggests allegory. Therefore, the basis of this superstructure ought also to relate to allegory.'¹⁰ Reading Scripture, and the act of exegesis, should be founded on a thorough knowledge of history, and only then may one move to the allegorical level. Typological exegesis attempts to create analogies between events described in the Old Testament and those in the New, as well as with events and people contemporary with the exegete. Typological exposition unearths prefiguration in the Old Testament of events disclosed in the New, and frequently allegorical and typological approaches to Scripture are closely associated.¹¹ For the most part, by the time Hugh wrote the *Didascalicon*, the typological approach to Scripture had become amalgamated with allegory.¹² Hence, time and allegory are related, forming part of the 'tools' used by the medieval exegete, joined by typological exegesis, and the requirement for the student to have a firm grasp of history.¹³

Given this relationship between time and allegorical exegesis via typological exposition, why should architecture offer a suitable medium for allegorical exegesis, and typological exegesis in particular? Discussing Hugh of Saint Victor's architectural metaphor for allegory, Robertson writes, 'the same metaphor pertains to the architecture of the reader's mind (*fabrica mentis*), to be built by good education.'¹⁴ This concurs with the first and second chapters of this thesis, which highlighted the importance of architecture in developing pedagogical processes, by providing a framework based on architecture. Allegory, and its

¹⁰ Hugh, *The Didascalicon*, p. 141.

¹¹ Duncan Robertson, *Lectio Divina: The Medieval Experience of Reading* (Collegeville, Minn., 2011), p. 42.

¹² *Ibid.*, p. 11.

¹³ In Hugh of Saint Victor's opinion history was the first subject which ought to be learned by the student, Hugh, *Didascalicon*, p. 135.

¹⁴ Robertson, *Lectio Divina*, p. 221.

temporal application in typological exegesis, allows the church building itself to perform the role of such a framework, this time in the visible and physical world. Honorius demonstrates the tendency to use architecture in this way, as he provides an extensive list of architectural elements and materials and relates them to aspects of Christian history. As a result, we will see that the didactic qualities of architecture are not confined to two-dimensional representations on a manuscript folio, as seen in the previous two chapters, but that the medieval church building can act as a four-dimensional aid for teaching and understanding the Christian past and future.

Honorius Augustodunensis

Honorius represents one of the most understudied figures of the twelfth-century renaissance, a surprising fact given the large amount of work he produced, and the very large number of manuscripts which remain from the twelfth and thirteenth centuries.¹⁵ 'Honorius is best known for being unknown. His real name and identity has eluded medievalists.'¹⁶ Our knowledge of Honorius' life is sparse and open to question; scholarly work on the subject has only slowly developed over the last century. One reason for this state of affairs is due to Honorius' own decision to remain anonymous. In his popular work, the *Elucidarium*, Honorius writes: 'Moreover, I decided to conceal my name, for fear that destructive envy might bid its devotees

¹⁵ Honorius provided a list of works completed by him in his *De luminaribus*. These are; *Libellum De sancta Maria, qui Sigillum sanctae Mariae intitulatur: unum De libero arbitrio, qui Inevitabile dicitur: unum libellum Sermonum, qui Speculum Ecclesiae nuncupatur: De incontinentia sacerdotum, qui Offendiculum appellatur; Summam totius, de omnimoda historia; Gemmam animae de divinis officiis Sacramentarium de sacramentis, Neocosmum de primis sex diebus, Eucharistion de corpore Domini; Cognitionem vitae de Deo et aeterna vita; Imaginem mundi de dispositione orbis; Summam gloriam de Apostolico et Augusto; Scalam coeli, De gradibus visionum, De anima et de Deo quaedam de Augustino excerpta, sub dialogo exarata; Expositionem totius Psalterii cum Canticis miro modo; Cantica canticorum exposuit, ita ut prius exposita non videantur. Evangelia, quae beatus Gregorius non exposuit; Clavem physicae de naturis rerum; Refectionem mentium; De festis Domini et sanctorum. Pabulum vitae, de praecipuis festis; hunc libellum De Luminaribus Ecclesiae*. PL 172.232B-234A.

¹⁶ Carolyn Muessig, 'Audience and Preacher: *Ad Status* Sermons and Social Classification', in Carolyn Muessig (ed.), *Preacher, Sermon and Audience in the Middle Ages* (Leiden, 2002), pp. 255-278, at p. 257.

scorn and neglect a useful work. May the reader, however, pray that it be recorded in heaven, and never be expunged from the book of life.¹⁷ Honorius was concerned that his works would be judged based on the prejudices of the reader against the author, instead of letting the work stand by itself.¹⁸ Honorius' caution has worked too well, so that it is now difficult to make firm statements about his life.

Knowing about Honorius' life allows us to contextualise his work and help to determine his aims when writing. Three types of evidence frequently appear in work on Honorius' career; the location of the manuscript witnesses, the content of the work, and finally the word 'Augustodunensis,' and to what place it could apply. Before J. A. Endres' seminal work on Honorius, the epithet Augustodunensis was taken to refer to Autun – in Latin *Augustodunum*.¹⁹ However, Endres demonstrated that none of Honorius' manuscripts can be connected with the city, and that Honorius never mentions the city in any of his works. The conspicuous absence of Autun in Honorius' work has then been taken to mean there is unlikely to be a connection between Honorius and the city. Moreover, Augustodunensis may be interpreted in several other ways; scholars have demonstrated that Cashel, Canterbury, and Regensburg may be referred to in forms which closely resemble 'Augustodunensis.'²⁰ Authors from several European regions, including England, Germany, Austria influence Honorius' work. For example, Honorius' debt to Anselm of Canterbury (d. 1109) has remained a consistent thread

¹⁷ Cited in Eva Matthews Sanford, 'Honorius, Presbyter and Scholasticus', *Speculum*, 23 (1948) pp. 397-425. '*Nomen autem meum ideo volui silentio contegi, ne invidia tabescens suis juberet utile opus contemnendo negligi: quod tamen lector postulet ut in coelo conscribatur nec aliquando de libro viventium deleatur*, PL 172: 1110A, 'But I have desired that my name be cloaked in silence, lest, through disdain, consuming envy bid its own to neglect a useful work; yet let the reader ask that it be written in heaven, and that it never be struck out of the book of the living.'

¹⁸ Sanford outlines Honorius' belief in human deification after the resurrection, and the subsequent controversy surrounding it, Sanford, 'Honorius', p. 416.

¹⁹ Joseph Anton Endres, *Honorius Augustodunensis, ein Beitrag zur Geschichte des geistigen Lebens in 12. Jahrhundert* (Munich, 1906).

²⁰ Sanford, 'Honorius'; R. W. Southern, *Saint Anselm and His Biographer: A Study of Monastic Life and Thought, 1059-C.1130* (Cambridge, 1963), p. 216.

in scholarship about Honorius, with both figures linked by their focus on Christianized Platonism, which has been interpreted to mean Honorius knew Anselm's work directly.²¹ While some doubt has been cast on any direct influences between Anselm and Honorius, V.I.J. Flint's examination of the English manuscripts of Honorius' *Elucidarium* display special emphasis on Anselm's teaching.²² In these manuscripts Anselm is the only contemporary author's name to be placed in the margins, where the copyist indicated sources of a particular passage or idea. Flint argues that Honorius could only have known particular parts of Anselm's theology, and the changes Anselm made to his work, by knowing Anselm in person. In Flint's final extended work on Honorius she even suggests that Honorius and Anselm may have known each other before the latter's move to Canterbury.²³ Outside of England, many extant manuscript witnesses to Honorius' work appear in southern Germany, clustered around Regensburg, and Lambach in Austria.²⁴ Honorius also elaborates on Isidore of Seville's description of Germany by adding supplemental information about Regensburg, indicating the city was special to him in some way.²⁵ In sum, Honorius has strong links with both England and Germany, leading scholars to take the following narrative as broadly representative of Honorius' life.²⁶

²¹ Ibid., pp. 209-217.

²² F. Bliemetzrieder, 'L'oeuvre d'Anselme de Laon et la littérature théologique contemporaine. I. Honorius d'Autun', *Recherches de théologie ancienne et médiévale*, 5 (1933), pp. 275-291, was the first to point out the strong intellectual links between the two authors. R.D. Crouse, 'Honorius Augustodunensis: The Arts as *Via ad Patriam*.' *Congrès international de philosophie médiévale. arts libéraux et philosophie au moyen âge* (Montréal, Paris, 1969), pp. 531-539, emphasises John Scottus Eriugena's influence on Honorius over that of Anselm. The argument is reinforced in: R.D. Crouse, '*Intentio Moysi*: Bede, Augustine, Eriugena and Plato in the *Hexameron* of Honorius Augustodunensis', *Dionysius*, 2 (1978), pp. 137-57. Flint's work on Honorius' manuscripts can be found in: V.I.J. Flint, 'The Sources of the 'Elucidarius' of Honorius Augustodunensis.' *Revue Bénédictine*, 85 (1975), pp. 190-8.

²³ V.I.J. Flint, 'Honorius Augustodunensis', in Frank Gary (ed.), *Authors of the Middle Ages* (13 vols., Aldershot, 1995) VI., pp. 125-127. Flint tenuously concludes that 'Honorius was a member of the same minor nobility of Savoy and the Alps from which St Anselm and St William of Fruttuaria both stemmed.'

²⁴ A handlist of manuscripts can be found in V.I.J. Flint, 'The Place and Purpose of the Works of Honorius Augustodunensis', *Revue Bénédictine*, 87 (1977) pp. 97-127. This list is supported by a bibliography of published editions of Honorius' works in: Flint, *Honorius*, pp. 177-180.

²⁵ Sanford, 'Honorius', p. 398. The note appears in the *Imago mundi*, chapter 25 of the first book.

²⁶ Roger E. Reynolds, 'Further Evidence for the Irish Origin of Honorius Augustodunensis', *Vivarium*, 7 (1969) pp. 1-8.

Honorius was born and first educated in southern Germany, possibly in the city of Augsburg, having been born with the name Heinricus or Henricus.²⁷ He flourished during the reign of Emperor Henry V (d. 1125), to whom Honorius refers in his *De luminaribus*.²⁸ Honorius was first a canon of Augsburg and presumably educated in the city's cathedral school, before Honorius' reaction to an anti-reforming cleric was to go elsewhere.²⁹ Upon leaving Germany he moved to England and most likely to the Benedictine foundation of Canterbury, where Anselm of Canterbury exerted a strong influence on him. While there Honorius wrote and researched some of his most important works, including the *Gemma animae*, although he may also have moved around Britain collecting works of particular interest to him. It is probable that Honorius spent time in Worcester, Winchester, and Rochester whilst keeping in contact with the monks at Canterbury.³⁰ It was perhaps at Canterbury that Honorius changed his name from Heinricus, using the descriptor Augustodunensis to indicate his original home of Augsburg.³¹ Following Anselm's death in 1109 Honorius moved back to Germany, and most likely Regensburg, and the *Alte Kappel* there; working prolifically under the headship of bishops Hartwig and Cuno. In 1133, or thereabouts, Honorius left the *Alte Kappel* to join the Benedictine order at either Lambach in Austria or St. James in Regensburg, to whom he bequeathed a large number of his works. The content of Honorius' works indicates he was

²⁷ V.I.J. Flint, 'Heinricus of Augsburg', p. 157. Cf. footnote 22 for Flint's alternative suggestion that Honorius was born in Savoy.

²⁸ *Sub quinto Henrico floruit*. PL 172: 234A. Flint highlights that the Augustinian Priory of St. Magnus' seventeenth-century catalogue includes the note '*Honorii Augustodunensis ecclesiae presbyteri et scolastici, qui vixit sub Henrico imperatore quinto anno MCXX.*' 'Honorius, priest and *scholasticus* of the church Augustodunensis, who lived under the Emperor Henry V in the year 1120.' Flint, *Honorius*, p. 99. See also, F. Fuchs, *Bildung und Wissenschaft in Regensburg. Neue Forschungen und Texte aus St. Mang in Stadthof* (Sigmaringen, 1989), p. 56.

²⁹ V.I.J. Flint, 'The Career of Honorius Augustodunensis. Some Fresh Evidence', *Revue Bénédictine*, 82 (1972) pp. 63-86. While Honorius was almost certainly known by another name during his lifetime, probably Heinricus, throughout this thesis I will refer to him as Honorius.

³⁰ Flint, *Honorius*, pp. 105-106.

³¹ Flint, 'The *Elucidarius*', pp. 178-89.

aware of earlier and contemporary Irish scholarship, implying he had a connection with the recently established Irish monastery of St. James in Regensburg.³² This brief outline of Honorius' life demonstrates he was well-travelled, and eager to learn from the people around him.³³

Time in Honorius

This third chapter focuses on the role of time in Honorius' didactic works; to do so I shall discuss time and its relationship with material culture during the twelfth century. Honorius' incorporation of time into his commentaries is not the same as typological exegesis which was discussed above. Whereas typological exegesis forms a part of the commentary tradition in the Middle Ages, for Honorius time is part of a didactic strategy which embraces the dynamic nature of the liturgy; and allows him to move typology from the confines of the written word to the living experience of the reader or hearer. Honorius uses typological exegesis to bring the events and objects of the past into the present; he envisions the objects of the present as epistemological items which can be wielded by the medieval teacher in a physical, architectural context. In this way, time and architecture become related.

Modern physics has demonstrated the relationship between space, in three dimensions, and time as an additional fourth.³⁴ Macrobius, in the fifth century, already identified time as a *dimensio*, and while never referring to it as a 'fourth' dimension, it is

³² Southern, *Saint Anselm*, p. 216.

³³ There is much disagreement about the details to Honorius' life, and the outline I have provided relies heavily on the work of V.I.J. Flint, but it is worth noting several works which disagree with Flint's argument, notably: Marie-Odile Garrigues, 'Qui était Honorius Augustodunensis?' *Angelicum*, 50 (1973), pp. 20-49, and eadem, 'Quelques recherches sur l'oeuvre d'Honorius Augustodunensis'. *Revue d'Histoire Ecclésiastique*, 70 (1975), pp. 338-45.

³⁴ Stefan Klein, *Time: A User's Guide* (London, 2008).

reasonable to assume that he perceived it as an addition to the dimensions of length, breadth, and height.³⁵ By the twelfth century, space and time were understood to be closely related. William of Conches, when discussing the relationship between time and the creation of the world speculates that time is the 'dimension of delay.'³⁶ Incorporating time into analyses of medieval architecture highlights the dynamic and flexible nature of contemporary materiality, and the symbolism associated with it. Albertus Magnus recognised the importance of incorporating a dynamic model of a body's motion, applying the term *ubi* ('where') in order to express it.³⁷ This faculty of recognising change means the significance and allegorical content of structures can change over time. The didactic texts discussed in the first chapter, and Richard of Saint Victor's recreations of Ezekiel's Temple in the second chapter present architecture as a static or immutable framework or object. Architecture, however, was not experienced as a static entity, but as space and structure which existed over the lifetime of a community. A building reached back to the past, from its establishment and initial founders to the present and the people who inhabit it currently, and forward to its future as a space for subsequent generations. This property of architecture and material culture more widely forms the basis of Honorius' approach to didactic materialism.

Historiography concerned with determining the relationship between time, as the fourth dimension, and intellectual culture is a growing field of research encompassing history and philosophy, as well as evolutionary science.³⁸ The advantage it offers, in these

³⁵ In his *Saturnalia*, Macrobius' description is that, *tempus est certa dimensio* in his *Saturnalia*, translated as 'time has fixed measurements,' Macrobius, *The Saturnalia*, trans. Percival Vaughan Davies (New York; London, 1969), I. 8., p. 64.

³⁶ Richard C. Dales, *Medieval Discussions of the Eternity of the World* (Leiden, 1990), p. 28.

³⁷ Sylla, 'Physics', pp. 352-55.

³⁸ For example, John Marenbon, *Abelard in Four Dimensions: A Twelfth-Century Philosopher in His Context and Ours* (Notre Dame, 2013); Eva Jablonka, *Evolution in Four Dimensions: Genetic, Epigenetic, Behavioral, and Symbolic Variation in the History of Life* (Cambridge, Mass.; London, 2005).

cases, is that it provides a framework for analysing objects and events over short or long periods of time, and mitigates against a static worldview. Scholarly work on the dynamic impetus given to architecture viewed through the lens of time has been particularly fruitful. For example, Avinoam Shalem refers to the experience of the fourth dimension in his work on the twelfth-century pilgrimage account of Abu al-Husayn Muhammad Ibn Ahmad Ibn Jubayr (d. 1217).³⁹ Shalem describes Ibn Jubayr's initial experience of Mecca as a two-dimensional experience in the form of images, which only moved into three dimensions when he arrived at the city in fulfilment of the Hajj. The Ka'ba, the large cuboid shrine, acted as the centre of devotion in Mecca, one which demanded a set liturgy which involved the rapid movement around the Ka'ba. This movement could only have existed in relation to the time it takes to move around the structures, so a full treatment of the subject must include a discussion of the fourth dimension. The importance of Ibn Jubayr's temporal experience continues after his pilgrimage, changing his future behaviour and influencing his reflection on his religious experience. Shalem's approach allows him to offer a fuller account of the pilgrimage and architectural experience, acknowledging it as one which takes place in 'real-time' and not outside of time.⁴⁰

Marvin Trachtenberg offers the fullest treatment of time and architecture by defining a conceptual model through which we may interpret the construction process from the architect's conception of a building to it falling into ruin.⁴¹ Trachtenberg's thesis provides a useful starting point, one where he considers time as an active agent in the

³⁹ Avinoam Shalem, 'The Four Faces of the Ka'ba in Mecca', in Paul Davies, Deborah Howard, and Wendy Pullan (eds.), *Architecture and Pilgrimage, 1000-1500: Southern Europe and Beyond* (Farnham, 2013), pp. 39-58, here p. 48.

⁴⁰ By 'real-time' I mean that Shaloam is able to render a more nuanced account of Ibn Jubayr's experience by moving through two, three, and four dimensions. To not incorporate the inherent necessity of time would be to take such an account out of time, by virtue of placing it outside the normative temporal experience.

⁴¹ Marvin Trachtenberg, *Building-in-Time: From Giotto to Alberti and Modern Oblivion* (New Haven, Conn.; London, 2010).

creation of buildings, contrasting two approaches – those before the publication of Alberti's *De rei aedificatione*, and that which comes afterwards.⁴² By proposing Alberti's work as the fulcrum around which the relationship between time and architecture revolves, Trachtenberg implies that there are distinctive pre-modern and modern modes of interpretation. These two modes are distinguished by an earlier (i.e., medieval) acceptance of time as a necessary agent which informs the process of construction. According to Trachtenberg the pre-modern approach to the beginning of a construction project was much freer, allowing for different forms and influences to encroach upon the final projected model.⁴³ The later mode rejects and fights time's ('chronophobic' or 'chronocidic') influence in the creation of architectural forms, by attempting to conform to a singular idea belonging to the architect.⁴⁴

To at least partially explain the conceptual model which underpins the dynamic nature of Honorius' incorporation of material culture into his commentaries we must examine how time was thought to interact with the universe and the people in it. To that end I will now outline contemporary approaches to the subject of time with a view to determining its application to the medieval environment. By the beginning of the twelfth century the study of time, its effect and measurement, was a burgeoning field of enquiry, which would be fully exploited by scholastic authors of the thirteenth century.⁴⁵ There were already several influential medieval texts which allow us to contextualise Honorius' discussion of time and the so called 'objective structures' of the twelfth century. The

⁴² Alberti's text was published in 1452. Trachtenberg argues that the work marks the turning point in the role of the architect, and the construction of buildings more widely. Leon Battista Alberti, *On the Art of Building in Ten Books*, trans. Joseph Rykwert, *et al* (Cambridge, Mass.; London, 1988).

⁴³ E.g., Trachtenberg, *Building-in-Time*, p. xxi.

⁴⁴ *Ibid.*, p. xxi.

⁴⁵ J. B. M. Wissink, *The Eternity of the World in the Thought of Thomas Aquinas and His Contemporaries* (Leiden, 1990).

earliest and most extended discussion of the topic appears in Augustine's *Confessiones* in chapter 11, which explicitly asks *Quid est enim tempus?*⁴⁶ Although Augustine is unable to provide an answer to the question 'what is time?' he does go some way to describing what it is made of, and how the human mind comes to understand it.

Temporality is problematized by Augustine when he considers the non-existence of the past and the future. He writes: 'Take the two tenses, past and future. How can they "be" when the past is not now present and the future is not yet present?'⁴⁷ Both the past and present do not exist because they cannot be located in the present; they are only relatively understood from the point of view of the present, and not as temporal entities in their own right. On this point, Calvin Troupe writes, 'Augustine has progressed in his project by moving the common-sense past, present, and future into the mental present, satisfying his concern that these three aspects of temporality exist in the face of the realization that the past and future do not exist as times separate from the present.'⁴⁸ Augustine's conclusion from this conceptual predicament is that: 'Perhaps it would be exact to say: there are three times, a present of things past, a present of things present, a present of things to come. In the soul there are these three aspects of time, and I do not see them anywhere else. The present considering the past is the memory, the present considering the present is immediate awareness, the present considering the future is expectation.'⁴⁹ Augustine, here, examines the *modes* through which past, present, and future are understood; memory (*memoria*), immediate awareness or observation (*de praesentibus*

⁴⁶ Augustine, *Confessiones*, XI. 14., p. 238.

⁴⁷ Augustine, *St. Augustine's Confessions*, trans. William Watts (Cambridge, Mass., 1912), XI, 14, pp. 238-39.

⁴⁸ Calvin L. Troup, *Temporality, Eternity, and Wisdom: The Rhetoric of Augustine's Confessions* (Columbia, S.C., 1999), p. 100.

⁴⁹ *Sed fortasse proprie diceretur: tempora sunt tria, praesens de praeteritis, praesens de praesentibus, praesens de futuris, sunt enim haec in anima tria quaedam, et alibi ea non video: praesens de praeteritis memoria, praesens de praesentibus contuitus, praesens de futuris expectatio*, Augustine, *Confessions*, XI, 20, p. 252.

contuitus), and expectation (*expectatio*). These three properties of time – especially the ‘immediate awareness’ of the present – are what Honorius takes advantage of by incorporating time into teaching texts.

If, then, time and temporality can only be experienced in relation the present, the relevant mode of interpreting the present is ‘immediate awareness,’ or ‘direct perception.’ Hence, the immediate environment has a bearing on the perception of the past, present, and future temporalities. Paul Ricoeur writes on the importance of the present as a series of signs, ‘Expectation is thus the analogue to memory. It consists of an image that already exists, in the sense that it precedes the event that does not yet exist. However, this image is not a physical impression left by things past but a ‘sign’ and a ‘cause’ of future things which are, in this way anticipated, foreseen, foretold, predicted, proclaimed beforehand.’⁵⁰ Here, Ricoeur echoes Augustine’s sense that the past and future do not physically exist, so human conception is tied to the present and one’s experience of it to gain knowledge of past and future. The image and sign in this sense are tied to the act of seeing; indeed Augustine states that: ‘I can see three times and I admit that they do exist.’⁵¹ The act of seeing here relates to the perception of the present. The things of the present act as signs which direct the mind’s knowledge of temporality forward, to the future or backwards to the past. The decision as to whether one’s consciousness moves forward or backwards is determined by the mind, and is not an innate quality of the sign or object perceived. Clearly this relationship between object and temporality is important too.

Before examining Honorius’ work in detail we may highlight contemporary analogues to his approach and application of time to the physical world. Hugh of Saint-

⁵⁰ Paul Ricœur, *Time and Narrative*, trans. Kathleen McLaughlin and David Pellauer (Chicago; London, 1984), p. 11.

⁵¹ *Tria tempora video fateorque*. Augustine, *Confessions*, XI. 20., pp. 252-253.

Victor's *De arca Noe morali*, as we saw in chapter two, provides an image – real or imaginary – in the form of Noah's ark in order to convey various stages of tropological exegesis. Hugh emphasises the three-dimensional quality of the ark, highlighting the various measurements or numbers, before explaining their mystical meanings. Yet time and its relationship with God is one of the primary subjects in both the Moral and Mystic Ark texts.⁵² The longitudinal dimension, running from top to bottom, of Hugh's ark denotes a linear representation of time or history and its progression from the beginning of the world to the coming of the New Jerusalem.⁵³ At the centre point of this construction stands Christ, who is the fulcrum around which time is constructed.⁵⁴ By placing Christ at the centre of this allegorical image, Hugh implicitly reflects Augustine's own view of the Incarnation as 'the stable point on which Time hinges.'⁵⁵ From top to bottom (i.e., east to west) the six ages of man appear on the ark, leading to the seventh and final age, the kingdom of Heaven.⁵⁶ In this context time is represented by movement from one end of the ark to the other, the structure of which Hugh has already described in detail. Hugh conflates the six ages into three groups: 'the period of natural law, the period of the written law, and the period of grace through which holy Church is from the world's beginning to its end advancing from this present life towards the future glory.'⁵⁷ This tripartite structure

⁵² 'Hugh's major theme is time and eternity, and it cannot be explained if it is unrelated to God.' See: John A.H. Lewis, 'History and Everlastingness in Hugh of St.-Victor's Figures of Noah's Ark', in Gerhard Jaritz and Gerson Moreno-Riaño (eds.), *Time and Eternity: The Medieval Discourse* (Turnhout, 2003), pp. 203-22, here p. 219.

⁵³ *Historia enim longitudinem arcae metitur, quia in serie rerum gestarum ordo temporis invenitur*, Hugh of Saint Victor, *De Archa Noe, Libellus de Formatione Arche*, edited by Patrice Sicard, CCCM 176 (Turnhout, 2001), IV, ix, p. 113. , 'Thus history is measured along the length of the ark, because the order of time is reached by a series of historical events.'

⁵⁴ Rudolph, *Mystic*, pp. 158-159.

⁵⁵ Troup, *Temporality*, p. 102.

⁵⁶ The six ages are from Adam to the Flood, the Flood to Abraham, Abraham to David, David up to the Captivity, the Captivity up to the coming of Christ, and finally the coming of Christ until the end of all time. Rudolph, *First*, p. 20.

⁵⁷ Hugh, *Selected Spiritual Writings*, I. 14. p. 64.

is reflected in the complete length of the ark which is 300 cubits. Hugh's spatial reconstruction of the ages of the world is pinned onto the framework provided by the ark. Hugh recognises that the tropological exegesis which underlies the proposed description of the ark must include the dimension of time, because in order for the actions of people to be described within a moral context, those actions must occur in time, within the fourth dimension.

Hugh could only imagine the Ark he describes, but Friedrich Ohly demonstrates that this relationship between time and architecture can be specific, and may also relate to real-world structures.⁵⁸ Ohly convincingly demonstrates that from the time of the Church Fathers until the High Middle Ages the dimension of length in both Church and Cross allegories was understood as relating to time or history.⁵⁹ Ohly shows that Hugh's identification of the Ark's longitudinal axis corresponds to the dimension of time, as well as other specific meanings of the other dimensions.⁶⁰ Far from being an idiosyncrasy of Hugh, Ohly shows that the alignment of history with length appears throughout the Middle Ages in the works of authors who were widely read. Ohly demonstrates that this chronological sequence was incorporated into the sculptural programme of Siena cathedral. Indeed, it may be no coincidence that the movement of history, allegorically speaking, begins in the east and runs westward, when this was the most common direction for church building programmes. In sum, he shows that time as an abstract concept was allegorically tied to architectural representations and also material culture. In a specifically

⁵⁸ Friedrich Ohly, 'Die Kathedrale Als Zeitenraum. Zum Dom Von Siena', in Friedrich Ohly (ed.), *Schriften Zur Mittelalterlichen Bedeutungsforschung* (Darmstadt, 1977) pp. 171-273.

⁵⁹ Ibid., p. 182.

⁶⁰ Hugh's quote about the length of the ark appears above. The other dimensions are identified thus: 'Allegory is measured in the width of the ark, because in the participation of the sacraments it remains in the collective faith of the people. Tropology is measured in the height.' Hugh of Saint Victor, *De Archa Noe*, IV, ix, p. 113.

architectural sense time aligns with the longitudinal line of the medieval Church, running from east to west, from the most sacred area at the altar, down through the nave. If Honorius takes advantage of the relationship between time and material culture, as I contend, he is not the only one to do so; both Hugh and Siena cathedral exploit this relationship.

Honorius' *De imago mundi* examines and attempts to describe the natural world as clearly as possible. The structure of the work is similar to Carolingian encyclopaedic texts, such as Isidore of Seville's and the Venerable Bede's *De rerum natura*. Indeed these similarities have led scholars to identify an explicit link between the Carolingian encyclopaedists and Honorius' intentions.⁶¹ The work was written by Honorius between 1110 and 1139, and was revised further after his death to incorporate recent history.⁶² The purpose of the work was for 'the instruction of the many, for those lacking many books;' it is an explicitly didactic work.⁶³ Whereas the first book is concerned with the world, 'according to the corporeal eye,' the beginning of the second book treats time and the elements by which it is constructed and understood.⁶⁴ More specifically Honorius writes: *sequenti iam tempus in quo volvitur oculis cordis anteponamus*.⁶⁵ Honorius describes time in terms of the divisions used to measure its passing, from eternity to the day and the minute. The purpose is not to offer a philosophical discourse on the nature of time, like Augustine, but to clarify the agreed methods used to measure it, and the natural events

⁶¹ V.I.J. Flint, 'Honorius Augustodunensis: Imago Mundi', *Archives d'histoire doctrinale et littéraire du moyen age*, 49 (1982) pp. 7-153, here pp. 16 and 45-46.

⁶² *Ibid.*, p. 9.

⁶³ *ad instructionem itaque multorum, quibus deest, copia librorum*. See, *Ibid.*, p. 49. The text could also be translated to read Honorius is teaching about 'many things.'

⁶⁴ *Ibid.*, p. 92.

⁶⁵ 'Now, in the following, time, in which the which [the world] passes through, we now place before the eyes of the heart.' It should be noted that Honorius still emphasises the act of seeing as part of teaching and learning process. *Ibid.*

which give rise to the different hours of day and night through the year. Honorius follows his contemporaries by first defining three forms of time: eternity, perpetuity, and the time of the world, *Aevum*, *Tempora aeterna*, and *Tempus mundi*.⁶⁶ Eternity belongs to God alone; the property of perpetuity belongs to the angels and the primordial world (*archetypum mundum*); whereas the time of the world (*mundi*) itself was created and will end.

In a manner similar to Hugh of Saint Victor, Honorius uses structural imagery derived from contemporary material culture to provide a clear image for explaining time. Honorius writes: *Veluti si funis ab oriente in occidentem extenderetur, qui quotidie plicando collectus, tandem totus absumatur. Per hoc extenduntur saecula, sub hoc currunt universa in hoc mundo posita. Hoc uniuscujusque vita mensuratur. Hoc series dierum, et annorum terminatur.*⁶⁷ The image of the rope allows Honorius to describe time's property of linearity: the rope must have a beginning and an end, which conveys the boundaries of the fourth dimension. In this image time is a finite resource inherently associated with the creation of the world; each moment it is being consumed like a rope gradually rolling up; it also illustrates how different individual strands of experience can be combined into a single coil. Time is a necessary part of the world.

Honorius' orientation of time, in the preceding analogy, as moving from east to west is exactly that of Hugh of Saint Victor in his *The Mystic Ark*, and elsewhere. The exact date of *Imago mundi* remains unknown; however, it would seem that Honorius and Hugh, as Germanic contemporaries, agree that topographically speaking time moves from east to west, or top to bottom when represented in two dimensions (remembering that

⁶⁶ Ibid.

⁶⁷ 'Just as if a rope was extended from east to west, which every day is rolled up a little, so that finally all of it is used up. Through this the ages are laid out, under which all things run having been placed in this world. With this each life is measured, and with this the sequence of days and years is ended.'

medieval maps placed east at the top and west at the bottom of the page). Hugh states that: *In hoc spatio mappa mundi depingitur ita ut caput arcae ad orientem convertatur, et finis ejus occidentem contingat, ut mirabili dispositione ab eodem principe decurrat situs locorum cum ordine temporum, et idem sit finis mundi, qui est finis saeculi.*⁶⁸ Despite Hugh's claim of wonder at the composition of time, we have demonstrated that the conceit of offering an image which emphasises the linearity of time, where the beginning is placed to the east and the end is placed to the west, was not as original as might be thought.⁶⁹ V.I.J. Flint could not find a source for Honorius' image of the rope, implying Honorius himself created it, but by comparing it with Hugh's structural description of time we can say the two accord in terms of direction from east to west. Flint also did not identify Honorius' use of the rope analogy in his outline of the life of Paul in the *Speculum ecclesiae*. Here he describes James and John preaching east and west, like 'two ropes encompassing and drawing together the faithful.'⁷⁰ Honorius uses the same image of the rope extending from east to west, as a metaphor for both the extension of space and the movement of time. On each occasion he uses it, the image is founded in a contemporary object.

At the beginning of this chapter we identified the liturgy as one of the 'structures' which come under the influence of time, and this relationship is clearly outlined by Honorius. Time and history appear in various formats throughout Honorius' works, from his discussion of time and eternity to a history of the world; he also offers the fullest

⁶⁸ Conrad Rudolph translates this as, 'A map of the world is depicted in this area in such a way that the top of the Ark is directed toward the east and its bottom touches the west to the effect that – in its extraordinary arrangement – the geographical layout of the sites extends downward in sequence with the events of time from the same beginning, and the end of the world is the same as the end of time.' Rudolph, *First*, p. 28.

⁶⁹ Conrad Rudolph emphasises the importance of the author's phrase 'extraordinary arrangement', with a view to arguing that Hugh would hardly use the phrase in reference to his own work, and hence indicates that *The Mystic Ark* is a *reportatio*, and not strictly written by Hugh, although it was conceived by him. Ibid., p. 28.

⁷⁰ [...] *verbum Dei disseminans, Orientem et Occidentem quasi duobus funibus complexum ad fidem pertraxit, Speculum ecclesiae* PL 172: 974C.

explication of the medieval liturgy completed during the twelfth century, appearing in the *Gemma animae*. Honorius' concern for temporal matters, coupled with his consistent use of structural imagery, make him an excellent source for the development of the subject at the beginning of the twelfth century, and the twelfth-century renaissance more widely. Three texts are primarily concerned with liturgical time, or more precisely the major feast days throughout the church calendar; the *Speculum ecclesiae*, the *Sacramentarium*, and the *Gemma animae*.

The *Speculum ecclesiae* is a sermon collection by Honorius which provides exemplary sermons for different feast days and sermons intended for a particular audience.⁷¹ In addition to the provision of sermons, Honorius states at the beginning of the text that he seeks to teach the art of speaking and preaching.⁷² The sermons appear under the rubric of the days on which they should be spoken; for example the first is titled: *De nativitate domini*, which begins with a reading from Isaiah 49.⁷³ At the end of this sermon Honorius offers an additional text which was to be included by the speaker if time permitted.⁷⁴ The structure of this text reveals Honorius' concern both for time over the course of the year, and the time in the mass given over to the sermon, emphasising that time is a limited resource. Whilst the organisation of sermon collections according to the liturgical calendar is not unusual, the content of the sermons continues this discussion of time. For example Honorius writes, *Humana quippe vita nocti comparatur, quia tenebris ignorantiae obscuratur. Haec XII horis dimensuratur, quia praesens vitae XII mensibus circumrotatur. In IIIIor vigiliis partitur [sic], quia annus IIIIor temporibus, vere, aestate,*

⁷¹ The so called *sermones ad status*, discussed in: Carolyn Muessig, 'Audience and Preacher', pp. 255-278.

⁷² Honorius Augustodunensis, *Speculum Ecclesia*, PL 172: 861.

⁷³ *Laetentur coeli et exsultet terra. Jubilent montes laudem, quia consolatus est Dominus populum suum et pauperum suorum miserebitur*, PL 172: 815A

⁷⁴ *Hic fac finem si velis. Si autem tempus permittit, adde haec* PL 172: 819.

*autumno, hieme metitur. Tres horae singulis vigiliis annotantur, quia III menses unicuique tempori assignantur.*⁷⁵ Importantly, here we see that for Honorius time is measured, an action described by the term *dimensuratur*, implying a connection with the *dimensiones* of length, width, and height.

We have demonstrated that for Honorius experience of time is reliant on the present, specifically the objects of the present. These objects point the subject forwards or backwards through time by means of allegorical and typological thought processes. This temporal model was not abstract but was applied to the context of material culture, appearing in the work of Hugh of Saint Victor, and elsewhere, as Ohly has shown, such as in the longitudinal axis of Siena cathedral. In this way architecture, as a representation of space, is intimately related to time, holding the potential to immerse the subject or student in the events of the past and future. We will see that Honorius' *Gemma animae* clearly demonstrates the use of objects to tell the history of the world.

Honorius' Didactic Materialism

A large number of Honorius' works were created for teaching purposes, providing texts for religious houses with few books or no library.⁷⁶ Whilst he did not create textbooks, Honorius does attempt to convey complicated theological ideas in a form easily understood by contemporary students.⁷⁷ Particularly important for our purposes is his pedagogical method, which I have called 'didactic materialism.' This takes examples from material culture, including

⁷⁵ 'Human life is composed of night and day, because it is obscured by the shadow of ignorance. This [day] is measured in twelve hours, because a year of life turns over in twelve months. The vigil is divided into four, because the year is measured in four seasons, spring, summer, autumn, and winter. It is noted that there are three hours in a single vigil, because three months is assigned to each season.' PL 172: 1078C-D.

⁷⁶ Sanford, 'Honorius', p. 397. Flint also writes about a number of Honorius' works that 'The prologues of all of them make it clear that Honorius is still involved in his twofold task of resolving difficulties for the simple minded and remedying the sad lack of books.' Flint, 'Chronology', p. 217.

⁷⁷ Southern, *Saint Anselm*, p. 211.

architecture, and wields them as a tool for explaining concepts, especially abstract concepts, an approach we have already seen examples of in chapter one and two. Honorius' 'love of viewpoints' and material culture is manifest in allegorical comparisons between objects, such as a lute or a key, and abstract concepts, such as the formation of the universe and the human soul.⁷⁸ Even the titles of Honorius' works display a concern for contemporary objects.⁷⁹ Examples include *Scala coeli* ('Stair of Heaven'), *Clavis physicae* ('Key of Physics'), and the *Gemma animae*, each of which can be described as a work for teaching. Honorius uses objects, especially architecture, in his teaching texts to illustrate his theories of vision and intellectual comprehension. Before looking at Honorius specifically it is possible to outline how didactic texts, such as Honorius', were used to teach and learn.

The medieval liturgy provided a 'school within the monastery,' which was aided by the 'incessant rhythm,' of the church calendar.⁸⁰ Years of exposure to an identical pattern of teaching provided a consistent point of reference for the medieval student. The student would gain a foundation for understanding the content and performance of the liturgy from the *magister* of the monastery, and the liturgy, for the most part, focused on the necessary chants.⁸¹ In this way the form of the liturgy could be learned, although this does not necessarily mean the details of the content would be. Illustrating this point, the child in Chaucer's 'The Prioress' Tale' learns the song dedicated to the Virgin, when he is murdered by the city's Jewish community. However, the innocence of the child is underlined by his unawareness of what the song means.⁸² Vitz asserts that the liturgy was used to educate the lay members of a

⁷⁸ Flint, 'Heinricus of Augsburg', p. 151.

⁷⁹ In the following examples Honorius refers to objects, but we have already seen that he presents architecture as a way of indicating one's path through the liberal arts in his *De animae*, see. p. 51.

⁸⁰ Boynton, 'Training for the Liturgy', p. 16.

⁸¹ Ibid.

⁸² Vitz, 'Liturgy as Education', p. 28.

congregation and not only the students of a monastery or house of canons, stating: 'the Catholic liturgy was the major source of education about their faith for laymen and women of the Middle Ages.'⁸³ Whilst this may be the case, Vitz undermines her point with the ambiguous statement that these lay people learned by 'osmosis,' and 'most of what was mastered was presumably learned without conscious effort.'⁸⁴ The implication is that the education of the laity was a haphazard or *ad hoc* affair, and not consciously considered by twelfth-century clerics. Honorius' role as an Augustinian canon, if we accept the outline of his life given above, gives him a particular responsibility for the education of the laity.⁸⁵ He constructs his texts to provide clear and pertinent examples for the concepts under discussion, giving impetus for the incorporation of the immediate environment into his works.

While the *Gemma animae* – discussed in detail below – is the focus of this chapter it is important to note that Honorius' other works display a similar concern for material culture and its pedagogical role. Honorius' *Elucidarium sive dialogus de summa totius Christianae theologiae* was his best known work, with 329 extant manuscripts from the twelfth century alone; it continued to be copied into the fifteenth century.⁸⁶ The work was translated into vernacular languages throughout the twelfth and thirteenth centuries, making it Honorius' most widely disseminated text.⁸⁷ It was almost certainly completed early in Honorius' career,

⁸³ Ibid., p. 20.

⁸⁴ Ibid., p. 21.

⁸⁵ The Augustinian responsibility for teaching lay members of an area has been explained above, see pp. 146-147.

⁸⁶ Honorius Augustodunensis, *L'Elucidarium et les lucidaires*, edited by Yves Le Fèvre (Paris, 1954), p. 10. English translation, Honorius Augustodunensis, *Basic Grammar for Medieval and Renaissance Studies*, trans. Michael Evans (London, 1995). Evans' translation is strictly literal in nature so I have not used it here. Flint, *Honorius*, p. 162 gives the number of manuscripts as 329, having made some additions made to D. Gottschall, *Das 'Elucidarium' des Honorius Augustodunensis* (Tübingen, 1992), pp. 297-306

⁸⁷ Discussions of the Elucidarius' vernacular translations may be found in: Monika Türk, *Lucidaire De Grant Sapientie: Untersuchung Und Edition Der Altfranzösischen Übersetzung 1 Des 'Elucidarium' Von Honorius Augustodunensis* (Tübingen, 2000); Ruhe Ernspteter, *Elucidarium und Lucidaires: Zur Rezeption des Werks von Honorius Augustodunensis in der Romania und in England* (Wiesbaden, 1993); John Morris-Jones, John Rhys, *The Elucidarium: And Other Tracts in Welsh from Llyvyr Agkyr Llandewivrevi, A.D. 1346 (Jesus College Ms. 119)* (Oxford, 1894).

whilst he was still in England and under the direct influence of Anselm in Canterbury.⁸⁸ The *Elucidarium* takes the form of a dialogue between a student and his master, where the two figures discuss a series of theological issues. It is divided into three books, and contains eighty-one chapters in total. In the prologue Honorius provides an outline of how knowledge should be structured:

*Fundamentum igitur opusculi supra petram Christum jaciatur et tota machina quatuor firmis columnis fulciatur. Primam columnam erigat prophetica auctoritas; secundum stabilitat apostolica dignitas; tertiam roboret expositorum sagacitas; quartum figat magistrorum solers subtilitas.*⁸⁹

Honorius uses the construction process, which must have been a consistent state of affairs in many monasteries of the period, as a means of illustrating the four tenets of Christian learning. Proverbs 9.1 states '*sapientia aedificavit sibi domum excidit columnas septem*,' hence the image of columns in an educational context would already be well-known.⁹⁰ By referring to a 'scaffold' Honorius draws the metaphor into the present, when the presence of scaffolding or a building project within a monastery or church must have been a common sight. This movement and emphasis on the materiality of the present and the perceptible environment is rooted in contemporary Augustinian ideas of time, and is present throughout Honorius' didactic works.

The final chapter in the *Elucidarium*, number twenty-one, focuses on the contrast

⁸⁸ Flint, 'Elucidarius', p. 179.

⁸⁹ Augustodunensis, *L'Elucidarium*, p. 369. 'The foundation of this little work rests on the rock that is Christ, and the whole scaffold is supported by four firm columns. Prophetic authority raises the first column; apostolic dignity stabilises the second; the wisdom of exegetes gives strength to the third; and the expert ingenuity of the masters fixes the fourth.' It is interesting to note that the order given here is chronological. *Machina* in this translation is taken to mean 'scaffold' based on Isidore of Seville's description of the word, see Isidore, *The Etymologies*, XIX. 20. 3., p. 382.

⁹⁰ 'Wisdom has built her house, she has hewn her seven pillars.' Hugh of Saint Victor, in a similar manner describes seven 'rules' for interpreting Scripture, Hugh, *Didascalicon*, pp. 122-125.

between the saints in heaven and the damned at the end of time (*antitheses beatorum et damnatorum*), where Honorius provides another architectural metaphor.⁹¹ In this section Honorius describes the saved soul's role in the celestial Jerusalem at the end of time. He writes:

*ad Dei aedificium collegerunt [...] Qui autem sunt adducti, ut lapides quadrati a summo opifice in aedificio coelesti sunt locati. Hi sunt electi, quatuor virtutibus politi, id est prudentia, fortitudine, justitia, temperantia, quibus muri Hierusalem fient reparati.*⁹²

Whilst the metaphor tradition of the 'living stones' comes from the Bible, here Honorius uses the building process to fully describe the elect in heaven.⁹³ He continues:

*Quidam vero lapides asperi, impoliti, ab opifice sunt reprobati, in ignem missi, et in calcem versi; murique his firmati quasi caemento et ornati. Hi sunt impii a coelesti aedificio rejecti, et in fornacem gehennae projecti: de quorum exitio iusti vinculo charitatis quasi caemento murus firmitus compaginabuntur; et eorum gloriosus collatione decorati, sine fine in Domino Deo jucundabuntur.*⁹⁴

Honorius details the creation of a structure to offer a more nuanced allegorical description, extending the pedagogical content of the object in the process. We will see that this technique, focusing not only on the materials but also the processes which combine to make

⁹¹ In the list of his works Honorius lists the books as: '*de Christo, de Ecclesia, de futura vita distinxit*', in Augustodunensis, *L'eucidarium*, p. 210, although these headings do not exactly match the chapter headings which appear in the text.

⁹² 'They may come together to God's building [...]. However, those who were brought there, were brought so that the squared stones may be placed at the highest point on the celestial building. These [stones] are the chosen, polished by the four virtues, prudence, fortitude, justice, and temperance, with which Jerusalem's walls were repaired.' PL 172: 1176B

⁹³ Josef C. Plumpe, '*Vivum Saxum, Vivi Lapides: The Concept of 'Living Stone' in Classical and Christian Antiquity*', *Traditio*, 1 (1943) pp. 1-14.

⁹⁴ 'Certain uneven and rough stones were rejected by the workman, cast into a fire, and turned into lime; and the walls were strengthened and decorated with these [rejected] stones. These [stones] are the impious who were rejected from the celestial building, and thrown into the furnace of Hell: from their destruction, the just will be joined by the bond of charity like the wall made firm by cement and they will be joined to the Lord by God, without end, gloriously decorated by being joined together.' PL 172: 1176C.

the object, is a consistent feature of Honorius' teaching work. In another section of the same text Honorius, in order to explain the nature of the universe and the sound of the cosmos, compares the sound to a stringed instrument, a *cithara*. He writes: *Summus namque opifex universitatem quasi magnam citharam condidit, in qua veluti varias chordas ad multiplices sonos reddendos posuit.*⁹⁵ Honorius recognises that the different chords which combine to form the cosmos is a difficult concept to understand, and uses the stringed instrument as a physical analogue to provide clarity. The concept is similar to that described in chapter one, where an abstract idea is explained by reference to a physical object.

These examples demonstrate the importance of material culture and architecture for Honorius, and reinforce the act of seeing and concepts of vision within the field of didactic materialism.⁹⁶ In addition to this, we have already seen the importance of perception in the articulation of the past, present, and future. As a result it is necessary to determine how Honorius' theories of vision relate to his teaching of theology and exegesis. While there is a relatively extensive literature on Richard of St. Victor's modes of seeing, there is little on Honorius' concept, which is surprising because Honorius articulates his view relatively clearly, albeit over several texts. Honorius, like Richard, differentiates between different modes of perception; however the categories he outlines are defined differently to Richard's. Honorius writes: *Sciendum est quod tribus modis videmus, visu corporali corpora, spiritu imagines, mente cogitationes vel voluntates nostras.*⁹⁷ For Honorius there are three ways of seeing, corporeal vision, spiritual images, and the intellectual activity of the mind. Honorius directly links the

⁹⁵ 'The great workman built the universe like a giant lute, on which he is able to play different chords to make many sounds.' PL 172: 587D.

⁹⁶ Such an approach has already been mentioned; 'vision is a central element of later medieval epistemology. It is not only the noblest of the senses, but the corporeal origin and requirement of intellectual vision.' in Cynthia Hahn, 'Visio Dei: Changes in Medieval Visuality', in Robert S. Nelson (ed.), *Visuality before and Beyond the Renaissance* (Cambridge, 2000) pp. 169-96, here p. 188.

⁹⁷ 'Take note, we see with three modes: objects by corporeal vision; images by the spirit; our thoughts or desires by the mind.' *Liber Duodecim Quaestionum*, PL 172: 1183A.

last mode of seeing, described as *mente* ('of the mind') with the mind's ability to distinguish between fields of knowledge; *et sicut mente scientiam grammaticae a scientia dialecticae separamus*.⁹⁸ Importantly, Honorius does not simply identify seeing with the mind as a faculty of understanding, but with a mode of seeing. Being able to discern between categories of the liberal arts is akin to seeing; just as a person may differentiate between objects by vision, so the mind differentiates between categories by the intellect.

It is worth pausing for a moment in order to compare Honorius' tripartite mode of seeing with his contemporaries' theories of vision. If we recall that vision of 'immediate awareness' was the primary mode through which the past is acknowledged it becomes clear how important perception is to the interpretation of time into Honorius' work. Corporeal, spiritual, and intellectual modes of vision were described by Augustine in similar terms to Honorius. Augustine writes: '*Tria igitur ista genera visorum, corporale, spirituale, intellectuale, singillitim consideranda sunt, ut ab inferioribus ratio ad superiora conscendat*.'⁹⁹ Beth Williamson notes that this division was very common throughout the Middle Ages; however, she does not indicate that the tripartite system was problematic.¹⁰⁰ Augustine's theory of vision was not well known during the early Middle Ages, and relied on transmission through *florilegia*.¹⁰¹ There were variations on theories of vision and its relationship with knowledge. For example, we have already seen that Richard of Saint Victor's description of visual modes of understanding is articulated differently to Honorius', hence, this tripartite description was

⁹⁸ 'Just as we separate knowledge of grammar from knowledge of dialectic with the mind..' PL 172: 1183B.

⁹⁹ Augustine, *De Genesi Ad Litteram*, 12.11., p. 392. 'Therefore there are three types of vision, corporeal, spiritual, intellectual which ought to be considered individually because in structure they rise from the inferior to the superior.'

¹⁰⁰ Williamson, 'Sensory Experience', pp. 12-13.

¹⁰¹ Isabel Moreira, 'Augustine's Three Visions and Three Heavens in Some Early Medieval Florilegia', *Vivarium*, 34 (1996) pp. 1-14, here pp. 3-4.

not as ubiquitous as Williamson implies.¹⁰² As described above, Richard of Saint Victor described four modes of seeing, which move from the corporeal experience of the exterior and visible world into the spiritual realm where sight, as we understand the term, is a hindrance to comprehension. Honorius places intellectual faculty at the climax of his visual structure; that is, the one furthest from corporeal knowledge. Honorius' description corresponds with Augustine's, implying that Honorius drew the tripartite structure from Augustine directly, or via one of the *florilegia*.¹⁰³

Honorius provides more information on his theories of sight and understanding in his work *Scala coeli major*. Like the *Elucidarium* this text is written in the form of a dialogue between a student and his master. The purpose of the *Scala coeli* is to provide an outline for the knowledge required to reach the 'third heaven'.¹⁰⁴ In order to do this there are three orders of steps, the bodily, the spiritual, and the intellectual. Each of these orders represents one 'heaven,' and the student is curious about all three and the manner in which one experiences them; for Honorius each is experienced via an act of seeing.¹⁰⁵ Corporeal visions are concerned with what we see through the body, spiritual are the likeness of bodily things formed with our spirit.¹⁰⁶ The intellectual vision is that which is neither bodily nor spiritual, 'but that essence of divine truth, just as it is of the angels or the nature of souls.' Honorius envisions the intellectual

¹⁰² Hahn states that one outcome of this difference resulted in Richard's discussion on dreams, see Hahn, 'Visio Dei', p. 174.

¹⁰³ Interestingly, the earliest version of text which describes Augustine's structure of vision is found in an Irish monastery at Reichenau. Southern highlights the possibility of using the content of Honorius' works in order to come to a more accurate origin for the author, and it is interesting to note that such an analysis reinforces both the Irish and German origins for Honorius: Southern, *Anselm*, p. 210.

¹⁰⁴ In 2 Cor 12.2 Paul describes a person having been taken up to the 'third heaven', implying this is the apex of spiritual experience.

¹⁰⁵ The student asks 'Et quid *Scala coeli*.' the teacher responds, stating at the end of the first chapter, '*tribus ordinibus graduum, corporalium, spiritualium, intellectualium* [sunt].' In the beginning of the following chapter the teacher refers to these steps by stating, '*Tres visiones sunt*.' PL 172. 1231A-B.

¹⁰⁶ *ibid.*, *Spiritualis est, qua similitudo corporalium in Spiritu nostro formatur.*

vision as the culmination of one's path, as the destination on a difficult journey.¹⁰⁷

Honorius' description of the 'intellectual vision' places it at the top of the hierarchy of vision modes. This intellectual mode has been recognised in previous scholarly work on medieval vision.¹⁰⁸ For Honorius intellectual vision corresponds to one's presence in the kingdom of God; through it one comes 'face to face' with God.¹⁰⁹ Honorius, like his contemporaries, highlights that intellectual vision does not rely on corporeal images, but points out that the image is helpful. In his *De animae exsilio et patria* Honorius uses the allegory of a journey towards the city of God, towards the homeland of the soul, in order to describe intellectual development.¹¹⁰ In the text the soul moves through different cities presented as allegories of the liberal arts. The inhabitants of each city are authors associated with the particular art of the city, and Honorius describes the use and objective of the city and art.¹¹¹ The soul ends in the kingdom of God, and reaches the vision of God in much the same way Honorius describes the fulfilment of the intellectual vision. *De exsilio* highlights the manner in which Honorius uses imagery taken from material culture, in this case the city, in an allegorical context. Intellectual vision is not concerned with material matters, but in order to convey the processes of intellectual development Honorius uses the monumental image of the city. He does not seek to convey the experience of the 'ineffable;' instead he wishes to describe the process through which one reaches it; Honorius is a teacher, not a mystic.

Honorius presents architectural details in order to describe the processes taking place during intellectual vision and experience. In chapter five the student asks 'what is the order of

¹⁰⁷ Honorius literally describes this intellectual progress as a journey in his work *De animae exsilio ad patriam*. This was discussed above, p. 54.

¹⁰⁸ For example, Isabel Moreira, 'Augustine's Three Visions and Three Heavens in Some Early Medieval Florilegia', *Vivarium*, 34 (1996), pp. 1-14.

¹⁰⁹ *facie ad faciem: Scala coeli*, 15, PL 172: 1236B.

¹¹⁰ PL 172: 1241D-1246D.

¹¹¹ For example, the first city is grammar, Donatus, and Priscian live in it. PL 172: 1243C-D.

spiritual vision?’¹¹² The teacher responds by saying that the mind is able to interpret senses both material and immaterial, things which are internal and external to the viewer. The path to understanding this process involves twelve steps, which allows the student to assimilate the material visions with the immaterial. The second step involves the student thinking about an image which is not presently in front of them. The example Honorius provides is ‘such as a city.’ For the fifth step Honorius writes: *cum nolentibus nobis varia forma rerum versatur in animo, ut oratione, pugnantium vel aedificantium*.¹¹³ The final architectural example Honorius uses appears in the sixth step, *cum aliqua facturi disponimus, cuncta prius in Spiritu cogitando formamus, ut fabricam domus*.¹¹⁴ It is possible, then, to tie Honorius’ concern for intellectual advancements and the desire to come ‘face to face’ with God to the appearance of architectural imagery in his didactic works.

The Gemma animae

The remaining part of this chapter will focus on two parts of Honorius’ *Gemma animae*; the description of the dedication of the church, and the commentary on the church building. Both present architecture as a dynamic force for teaching by incorporating architecture and time into the didactic qualities of the text. If we accept the outline of Honorius’ life, it would seem that the *Gemma animae* was partly written or researched in Britain, most likely in Canterbury.¹¹⁵ The *Gemma animae* consists of four books, the first of which contains 243

¹¹² *Quis est ordo spiritualis visionis*, PL 172: 1232B.

¹¹³ ‘When the various form of this object is turned over [considered] in the soul against our will, such as with prayer, a struggle, or building.’

¹¹⁴ ‘When we consider some thing to be made, first we form it in the Spirit by thinking, such as making a house.’ It could be argued that such a statement implies that by the beginning of the twelfth century there was not a well-known tendency to draw images of buildings before their construction. However, it may be that Honorius refers to inspiration in this statement, and the depiction of a planned building coming at a later stage in the construction process.

¹¹⁵ V.I.J. Flint, ‘The Chronology of the Works of Honorius Augustodunensis’, *Revue Bénédictine*, 82 (1972) pp. 215-42, here p. 226.

chapters and is titled *De missae sacrificio et de ministris ecclesiae*.¹¹⁶ It provides a description of the mass, a church, and different liturgical objects. The second book is called *De horis canonicis*, and considers the masses and liturgical events which take place at various times of the day; it contains sixty-eight chapters. The third book is titled, *De solemnitatibus totius anni*, and describes the liturgy through the entire church calendar, beginning with Advent Sunday and ending with Pentecost; it contains 169 chapters. The final book is *De concordia officiorum* and contains 118 chapters. There are fifty-one manuscript witnesses to the *Gemma animae*, either full copies of the text or fragments, indicating it was widely dispersed during the twelfth century and the period immediately afterwards.¹¹⁷ The Latin throughout is relatively simple, and the short chapters, sometimes only two lines in length, indicate the intended audience may have been students.¹¹⁸ There are relatively fewer manuscripts from the thirteenth and fourteenth centuries because much of the content was taken over and elaborated elsewhere. For example, the *Speculum ecclesiae mysteriae*, formerly attributed to Hugh of Saint Victor, replicates some of *Gemma animae*'s details.¹¹⁹ Sicard of Cremona's (d. 1215) *Mitralis* also considers the same subjects as Honorius, but in much more detail.¹²⁰ William Durandus' *Rationale divinarum officiarum* (d. 1296) remained popular until the sixteenth century, and

¹¹⁶ There is no critical edition of the *Gemma animae*, so this discussion takes Migne's *Patrologia Latina*, (172: 541-738B) as its source, with references made to manuscripts where necessary. All translations are the author's.

¹¹⁷ Flint, *Honorius*, pp. 164-65.

¹¹⁸ This statement accords with Flint's argument that many of Honorius' teaching works stem from the Benedictine drive towards pastoral care at the beginning of the twelfth century. See Flint, 'Elucidarius', pp. 185-86.

¹¹⁹ Migne attributes the text to Hugh based on readings from several manuscripts. However, recent scholarship has indicated that this is not possible by means of a later dating. See: Franklin T. Harkins, Frans Van Liere (eds.), *Interpretation of Scripture: Theory: A Selection of Works of Hugh, Andrew, Richard and Godfrey of St. Victor, and of Robert of Melun* (New York, 2013), p. 482.

¹²⁰ Sicardus of Cremona, *Mitralis: Der Gottesdienst Der Kirche*, edited by Lorenz Weinrich, CCCM 228 (Turnhout, 2011), see pp. 791-94, the greatest influence on the text was the *Gemma animae*.

overshadowed the *Gemma animae*, which influenced its content.¹²¹ Honorius most probably wrote much, if not the majority, of the *Gemma animae* during his residence in Canterbury.¹²²

Honorius gives the following reason for naming the *Gemma animae*: *Quia videlicet veluti aurum [sic] gemma ornatur, sic anima divino officio decoratur.*¹²³ For Honorius, knowledge of the divine office offers an important step in one's relationship with God, a relationship which is supported by the liturgy which takes place in the church building. He laments some people's knowledge of 'poets' fictions,' and the 'disputations of Plato,' compared to their ignorance of Christianity.¹²⁴ Honorius seeks to educate those who wish to profess their Christianity. Moreover, he is not concerned with 'abstract' knowledge of the mass and the divine office, stating that: 'He who does not understand what it is he does is just like a blind person.'¹²⁵ For Honorius the act of seeing corresponds to one's movement from the carnal experience of life through to the apex of vision – intellectual vision. The metaphor of the 'blind' Christian is a pointed reference to a stagnant state, when one is unable to move to the celestial Jerusalem.¹²⁶ The reader, then, is specifically required to take practical knowledge from the *Gemma animae*, and not merely gain a passive sense of what is occurring during the mass, and why.

Before beginning discussion of the architectural content of the *Gemma animae* it is important to question the architectural context of the text more widely. By this I mean, when Honorius discusses an altar, or choir, does he have a specific set of materials or structures in

¹²¹ Joseph Sauer, *Symbolik des Kirchengebäudes und seiner Ausstattung in der Auffassung des Mittelalters: mit Berücksichtigung von Honorius Augustodunensis Sicardus und Durandus* (Münster, 1964), p. 11.

¹²² Flint, 'The Chronology', p. 219.

¹²³ 'Because indeed, just as a gem is decorated by gold, so the soul is decorated by the divine office.' PL 172: 543.

¹²⁴ Ibid.

¹²⁵ *Qui enim non intelligit quae agit, est ut caecus, qui nescit quo vadat*, Ibid., 'for he who does not understand what he does, is like a blind man who does not know where he is going.'

¹²⁶ The metaphor of blindness is a commonly associated with the medieval Jewish community. It is presented iconographically in representations of 'synagoga' who is frequently depicted as blindfolded female figure.

mind; or, alternatively, does the allegorical exposition of structures, such as the window or door, have a real counterpart in a particular church? There are few markers in the *Gemma animae* which indicate Honorius had a specific structure in mind. The manuscript witnesses of the *Gemma animae* appear in Britain, France, Germany, and Austria, indicating that even if Honorius did have a specific structure in mind this did not prevent medieval readers from interpreting the architectural content in a native context (after local buildings and structures). As mentioned, Honorius most likely wrote much of the *Gemma animae* while staying at Canterbury. It may be that he envisioned the cathedral there as a template for the church described in the text. Some of the choir of Canterbury cathedral was damaged by a fire in 1174, and subsequently rebuilt in the Gothic style, and finished by 1184.¹²⁷ The previous Romanesque building, itself constructed shortly after the Norman Conquest in 1066, was recorded in an elaborate drawing of the waterworks of the monastery, appearing in the Eadwine Psalter (fig. 75).¹²⁸ Occasionally I will refer to this image in order to offer comparison between Honorius' descriptions and an appropriate image which would have been recognisable to the recipients of the *Gemma animae*. This is not to imply that Honorius specifically had Canterbury in mind; however, it is reasonable to think that the *Gemma animae* is connected to the building and monks there.

Honorius' description of the church could apply to many different buildings, which perhaps partly explains the popularity of the work. He envisions a stone church with a chancel,

¹²⁷ Millard F. Hearn, 'Canterbury Cathedral and the Cult of Becket', *Art Bulletin*, 76 (1994) pp. 19-52, here pp. 19-21. The primary work on the buildings of Canterbury cathedral still remains: Francis Woodman, *The Architectural History of Canterbury Cathedral* (London, 1981). See also, British Archaeological Association, *Medieval Art and Architecture at Canterbury before 1220* (London, 1982). The fire and the process of building the twelfth-century gothic structure was described in detail by the contemporary Gervase of Canterbury, see Mortet, *Recueil*, I., pp. 207-228. Woodman suggests that through analysis of the cathedral fabric it may be that Gervase's exaggerated the extent of the damage caused by the fire, Woodman, *Architectural History*, pp. 87-88.

¹²⁸ Francis Woodman, 'The Waterworks Drawings of the Eadwine Psalter', in Margaret Gibson, T.A. Heslop, and Richard W. Pfaff (eds.), *The Eadwine Psalter: Text, Image, and Monastic Culture in Twelfth-Century Canterbury* (London, 1992) pp. 168-77. Pls. 42-44.

choir, and crypt, and the entire building would be in the shape of a cross.¹²⁹ These basic components form the basis of almost any medieval church in Western Christendom; however, parts of Honorius' description suggest that he may have had a particular structure in mind; that is, the monastic cathedral at Canterbury. Indications of such a structure appear in different places in the *Gemma animae*, but when taken together we begin to get a picture of Honorius' intentions. In the following paragraphs I have identified several features of Honorius' church which may be transposed on to Canterbury cathedral as it would have appeared at the end of the eleventh and beginning of the twelfth centuries.¹³⁰ Further discussion of the possible links between the two appear towards the end of this chapter in those sections concerned with the particular parts of Honorius' church. There is no conclusive piece of evidence which proves the two churches are the same; however, when the evidence is taken together it would seem to be a plausible explanation for some of Honorius' statements.

In the first instance, Honorius gives the impression that he is discussing a particular church by the way he introduces key parts of the structure. In the section which discusses the medieval basilica and its typological links with the Jewish Temple, Honorius uses a series of near demonstrative pronouns; their presence gives the impression of familiarity with the particular parts of the church on the part of the reader. He writes:

Haec quoque domus Dei vocatur, quia in ea Dominus adoratur. Haec domus orationis, quia in ea populus fidelium ad orationem congregatur. Haec etiam aula Dei nuncupatur,

¹²⁹ A stone structure is indicated in GA I. 129: *Domus haec ex duris lapidibus construitur*, 'this house is constructed from strong stones.' The presence of a chancel, and choir is discussed below. Reference to the crypt appears in GA I. 134, *Criptae sub terra constructae sunt cultores secretioris vitae*, 'the crypts below the earth were constructed for the worshippers of the secret life.' The cruciform shape of the church is indicated in GA I. 147: *Ecclesiae, quae in modum crucis fiunt* [...], 'The church, which was made in the shape of a cross [...].'

¹³⁰ In 1070 the Anglo-Saxon church at Canterbury was re-built by the new archbishop, Lanfranc. In 1096 St. Anselm drastically modified the choir, work which seemed to have coincided with Honorius' stay at Canterbury. See, Francis Woodman, *The Architectural History of Canterbury Cathedral* (London, 1981), p. 23.

*quia in ea convivium regis aeterni celebratur. Haec quoque dicitur oratorium, quia locus est orationis fidelium. Haec templum quasi amplum tectum vocatur, quia conventus populi in ea quasi sub unum tectum coadunatur.*¹³¹

The result is certainly not conclusive, but it does indicate a sense of immediacy and close experience with the different parts of the church.

The monastic nature of this basilica becomes clear in Honorius' discussion of the cloister and its allegorical significance as paradise.¹³² Honorius makes explicit links between the cloister and particular forms of religious life, writing that, *Secundum hanc formam religiosi in claustro unanimiter dogunt [sic], nocte ac die in monasterio ad servitium Dei conveniunt. Et fideles adhuc saecularia relinquunt, communem vitam in claustro ducunt.*¹³³ In the following chapter, which proposes various connections between the cloister and paradise, Honorius explicitly discusses the advantages of monastic life.¹³⁴ For example, he writes, *In quo iusti ita a peccatoribus segregantur, sicut religiosae vitae professores a saecularibus in claustro sequestrantur. Porro monasteria praefert coelestem paradisum.*¹³⁵ From this is clear that Honorius has a monastic foundation, like Canterbury, in mind when writing book one of the *Gemma animae*.

¹³¹ GA I. 127, 'This too is called the house of God, because the Lord is worshipped. This is the house of prayer, because the faithful congregate in it to pray. This too, is called the hall of God, because the feast of the eternal king is celebrated in it. This too is called the prayer house, because it is the place of prayer for the faithful. This is called *templum* as if it is a large roof, because the assembly of the people is united in it as if under one roof.'

¹³² GA I.148-149.

¹³³ GA I. 148, 'According to this form religious men lived [reading *dogunt* as *degunt*] in the cloister harmoniously, they come together day and night in the monastery for the service of God. Still, the faithful leave behind the secular life, they lead a communal life in the cloister.'

¹³⁴ A short work on the various meanings of the cloister has been ascribed to Honorius, PL 172: 1247-1248C

¹³⁵ 'in which just men are divided from sinners, just as those who prefer the religious life are sequestered in the cloister. Therefore, the monastery prefigures the celestial paradise.'

Chapter 132 discusses the pictures in the church and the reason for their presence.¹³⁶ Specifically Honorius writes about paintings on the ceilings, stating that they show examples of 'just men, representing the adornment of the Church traditions.'¹³⁷ T.A. Heslop suggests that Honorius is referring to Canterbury in particular in this instance and draws a comparison with coeval wall-paintings at Hardham in Sussex.¹³⁸ Honorius seems to have taken an interest in paintings designed for the vaults, and it is possible to demonstrate one location Honorius is writing about specifically. In an earlier paper Heslop demonstrated that Honorius was at Worcester c. 1100, where he perhaps wrote his first commentary on the Song of Songs, the *Sigillum Beatae Mariae*.¹³⁹ The peculiar content of Honorius' commentary is reflected in the contemporary images of Mary in the Worcester chapter house, which are primarily concerned with the life of Mary. However, it seems unlikely that they correspond with Honorius' description of 'just men' in the *Gemma animae*, suggesting that it is unlikely that Honorius had Worcester cathedral in mind when writing the *Gemma animae*.

Two other features at Canterbury might be linked to Honorius' writing. First, in a section considering the place of atonement (*De propitiatorio*), Honorius describes its location as follows, *Propitiatorium, quod super altare locatur, est divinitas Christi, quae humano generi propitiatur. Gradus, per quos ad altare ascenditur, sunt virtutes, per quas ad Christum pertingitur*.¹⁴⁰ The description envisions an altar placed on a plateau with stairs leading to it,

¹³⁶ Honorius gives three reasons: they are the literature for the laity; to decorate the house of God, and they allow one to remember the lives of earlier people.

¹³⁷ This translation taken from T. A. Heslop, 'St Anselm and the Visual Arts at Canterbury Cathedral, 1093-1109', in Alixe Bovey (ed.), *Medieval Art, Architecture & Archaeology at Canterbury* (Leeds, 2013), pp. 59-81, here p. 71.

¹³⁸ Ibid., pp. 71-72.

¹³⁹ T. A. Heslop, 'The English Origins of the Coronation of the Virgin', *The Burlington Magazine*, 147 (2005), pp. 790-797, here p. 792.

¹⁴⁰ GA I. 136. 'The place of atonement, which is located above the altar, is the divinity of Christ, who is propitiated for humankind. The steps, through which the altar is ascended [toward], are the virtues, through which Christ is reached.'

which was exactly the case at Canterbury, which had an elevated altar in the east end.¹⁴¹ In addition to this, Honorius makes special mention of the windows in the church, writing that they are the doctors of the church who fight against heresy, and that the glass in the windows is the mind of the doctor.¹⁴² In his discussion of Anselm's choir Francis Woodman determines that the aisle windows were 'conspicuously bigger and more adventurous than others.'¹⁴³ On its own this correlation is insignificant, but taken in conjunction with the other evidence discussed here and later it is suggestive of a link between the church of the *Gemma animae* and Canterbury.

Dedication of the Church

Now we turn to Honorius' use of architecture as a didactic tool. In chapters 150-169 of the *Gemma animae* Honorius presents an allegorical exposition of the rite of dedication for churches. In it Honorius establishes the building as a framework for teaching, taking advantage of his tendency toward didactic materialism. The rite presented an opportunity to educate the congregation about their faith, and about the history of Christianity. The rite for the dedication of the church provides a discrete event, one which does not rely on various feast days before or afterward.¹⁴⁴ During the dedication ritual various parts of the church, and the events of the rite itself, are used to teach the reader or hearer by establishing typological relationships between the building, the past as well as the future. These typological analogies may then be incorporated into examples of sermons appropriate for the rite, such as Honorius'

¹⁴¹ Honorius' allegorical assignment of the virtues to the steps would imply that he considers there to be seven steps. In Lanfranc's church, however, there may have been eight steps the last of which significantly narrows when it reaches the level of the altar, Kevin Blockley, Margaret Sparks, Tim Tatton-Brown, *Canterbury Cathedral Nave: Archaeology, History and Architecture* (Canterbury, 1997), pp. 24-25.

¹⁴² GA I. 130.

¹⁴³ Francis Woodman, *The Architectural History of Canterbury Cathedral* (London, 1981), pp. 24-25.

¹⁴⁴ The event would take place ideally at the point the church was completed, but may have taken place earlier on occasion.

own *exemplum* in his *Sacramentarium*. Commentaries on the dedication ceremony, as they appeared in sacramentaries or other texts, formed part of a tradition before Honorius' *Gemma animae*. For example, the ninth-century *Quid significant duodecim candalae* provides an extended commentary on the actions of the priest, providing allegorical content for the liturgy.¹⁴⁵ Honorius' description of the rite differs from this Carolingian text because it prioritises the environment, i.e., the new church, whereas the author of the *Quid significant* focuses on the ancient nature of the dedication. In essence, Honorius begins his exposition with the present, whereas *Quid significant* begins with the past.¹⁴⁶ The dedication rite has an inherent focus on the structure of the church; hence it is possible to use the structure as scaffolding for determining allegorical and didactic significance.

Brian Repsher provides a complete description of the medieval dedication rite, along with analysis of its early medieval commentaries.¹⁴⁷ Here we will simply outline the liturgy with a view to contextualising Honorius' discussion of it. Repsher divides the rite into four sections each taking place in different locations. Part one begins outside the new building, where prayers are said to the relics, within a specially pitched tent. The bishop asperses the exterior walls of the new church with water, three times; after the third aspersion the bishop stands at the main entrance and taps the lintel three times. Part two takes place inside the new building. The bishops and ministers enter and pray. The abecedarium takes place, along with the

¹⁴⁵ Brian V. Repsher, *The Rite of Church Dedication in the Early Medieval Era* (Lewiston, N.Y.; Lampeter, 1998), p. 34. English edition of the text may be found at pp. 171-193.

¹⁴⁶ For example, the *Quid significant* begins 'One who, recalling ancient history, remembers with how much celebrity the tabernacle of the testimony and the temple constructed by Solomon, at the Lord's command, was dedicated, knows that the custom which the holy church holds in the solemn consecration of the house of the Lord is not of any [comparable] sort of dignity.' Repsher, *Church Dedication*, p. 171. Honorius however begins with the church, and describes it in an allegorical fashion, 'In the dedication of the church there is a union between the church and Christ. The bishop who does the consecration is Christ, he who was joined to the Church.' Honorius immediately presents the bishop as Christ, and does not rely on a person's knowledge of Solomon's Temple.

¹⁴⁷ Repsher, *Church Dedication*, pp. 44-66.

blessing of water, salt, ash, and wine.¹⁴⁸ Next the interior walls of the building are aspersed, and then the bishop anoints the altar, and all of the liturgical objects. Part three takes place outside the new building, where the saints are prayed to in front of the main entrance. The assembly then circles the building with the relics, before entering the church. The fourth and final part of the rite takes place in the church. The relics are deposited in the altar, and the altar itself is dedicated with incense. All the lights are lit in the building, and mass is celebrated for the first time.

The titles Honorius gives to the different chapters which describe the rite testify to the importance he places on the actual objects and materials used in it. The titles are: *De dedicatione ecclesiae*, *De domo non consecrata*, *De portis*, *De alphabeto*, *De quatuor angulis ecclesiae*, *De dextro angulo*, *De illo*, *Deus in adiutorium*, *De salo et cinere*, *De vino et aqua*, *De templo*, *De altari et cruce*, *De ministris*, *De oleo et altari*, *De chrismate*, *De incenso*, *De vasis et ornamentis*, *De reliquiis sanctorum*, *De veste animarum*, *De die iudicii*, *De certo loco et sacrificio*.¹⁴⁹ The majority of these chapters begin either with an object which appears during the rite, or concern the placement of an object. Whilst Honorius incorporates much of the content which appears in the Carolingian *Quid significant*, he has reorganised it to make the actions and objects the focus of attention.¹⁵⁰

For the most part, the typological analogies Honorius describes during the dedication rite are between the church and Christ's life in Judea and the passion. Honorius uses the elements of the church building to link typologically with the Christian past. For instance,

¹⁴⁸ The *abecadarium* involves writing the Latin and Greek alphabets separately from one corner of the church to another, making a cross in the centre. Interestingly, in Honorius' sermon for the dedication of the church he also mentions the Hebrew alphabet, but does not mention its orientation. The inclusion of the Hebrew alphabet is not mentioned in any other description of the ceremony.

¹⁴⁹ The titles are slightly different in Cambridge, Corpus Christi College, MS 391, where the emphasis falls on the action which takes places during the section under discussion, for example, the chapter titled *De ministris* appears as *Cur altare lintheo extergitur*.

¹⁵⁰ There are no chapter titles in *Quid significant*, Repsher, *Church Dedication*, pp. 171-193.

chapter 150 explains the purpose and the initial stage of the dedication rite, stating: *Episcopus fontem in atrio benedicit, et in circuitu aspergit, quia Christus fontem baptismatis in Iudaea consecravit.*¹⁵¹ Honorius uses this chapter to describe the meaning of the bishop and the font in the context of the rite. Two typological and historical facets are at work here. First the dedication rite offers several analogies to the sacrament of baptism, which occurs at the beginning of the life of faith and represents initiation into the Christian community.¹⁵² Second, Honorius offers an historical analogy with Christ's work in Iudaea. This format, the statement of the object or action followed by an allegorical exposition, is retained for the commentary on dedication. For example, chapter 152, titled *De portis* considers the door through which the bishop initially enters the building. It starts: *Portae quippe mortis sunt vitia et peccata. Portae vitae sunt fides, baptismus, operatio. Per eum, qui intus respondet, diabolus intelligitur, qui de domo Ecclesiae expellitur.*¹⁵³ The reference is to the story of the devil being expelled from heaven having rebelled with a host of other angels.¹⁵⁴ Honorius uses the church door as a catalyst for discussing the fall of the angels.

Having described the inscribing of the cross on the altar, Honorius moves to the process of cleaning it away,

¹⁵¹ 'The bishop blesses the font in the atrium, and asperses all round it [the water], because Christ consecrated the font of baptism in Iudaea.' During the eleventh and twelfth centuries the *atrium* could refer to a court outside the church, or a section of the church, possibly the vestibule. See Mortet, *Recueil*, p. 251, *Si clericus arat vel aedificat in atrio sine pontificali licentia* [...], 'If a cleric ploughs or builds in the atrium without papal licence [...]. Here *atrium* must refer to church land outside of the church building.

¹⁵² The rite of dedication was frequently linked to the sacrament of baptism. In a liturgical sense the aspersion of water at the beginning of the rite draws direct parallels with the sacrament. Repsher, *Church Dedication*, pp. 114-121.

¹⁵³ 'Indeed, sins and wrongdoings are the doors of death. The doors of life are the faith, baptism, and good works. "He who responds inside", means the devil, who is expelled from the house of the Church.' PL 172: 594B.

¹⁵⁴ Honorius alludes to this in the *Elucidarium: Cum Deus palatium sibi constitueret paries lapsus est, quando angeli corruerunt*, PL 172: 1176B.

*Post haec altare cum linteo extergitur, per quod Dominica passio intelligitur. Linum quippe de terra oritur, et cum labore ad candorem convertitur; et Christus de Virgine nascitur, et cum magno labore passionis ad candorem resurrectionis rediit. Hoc linteo altare extergitur, dum tribulatio Ecclesiae exemplo passionis Christi delinitur.*¹⁵⁵

Honorius uses both the material and the process of making the linen white, to explain aspects of the past and future, and in particular the Passion.

Following the lighting of the twelve candles, the priest knocks on the church door's lintel three times, until one of the clergy opens it and allows entry. Concerning the doors Honorius writes:

*Portae quippe mortis sunt vitia et peccata. Portae vitae sunt fides, baptisma, operatio. Per eum, qui intus respondet, diabolus intelligitur, qui de domo Ecclesiae expellitur [...]. Sed fortior superveniens eum expulit, spolia ejus distribuit (Matth. XII; Luc. XI); dum Christus eum passione vicit, et Ecclesiam ab ejus jure eripuit.*¹⁵⁶

Next the priest kneels: *Deinde pontifex prosternitur, pro consecratione domus Dominum precatur, et Christus se ante passionem in monte prostravit et pro Ecclesiae sanctificatione Patrem oravit.*¹⁵⁷ The doors point to the future, and the advent of Christ and the saving of the world from the clutches of the devil. Here, in a relatively quick sequence of events the symbolic

¹⁵⁵ 'Afterwards the altar is wiped down with a linen cloth, through which Passion Sunday is understood. Linen is born from the earth, and is turned to whiteness with work; and Christ is born from the virgin, and with the great labour of the Passion was returned to the white of the resurrection. The altar is cleaned with linen, while the tribulation of the church is softened by the passion of Christ.' Honorius seems to pun on the similar sound of *linleo* and *delinitur*, this may be to help the reader remember parts of the text. A similar allegorical description appears in Honorius' *Sacramentarium*, PL 172: 802A.

¹⁵⁶ 'Indeed, vices and sins are the gates of death. Faithfulness, baptism, and good works are the gates of life. He who answers inside the church is understood as the devil, who was expelled from the house of the Church [...]. But he who comes is stronger and expels him, and distributes his spoils, while Christ defeats him with the Passion, and snatches away the church from his law.' PL 172: 594B.

¹⁵⁷ 'Next the chief priest prostrates himself, prays for the consecration of the house of the Lord. Christ prostrated himself before his Passion on the mountain [of Olives] and prayed to the Father for the sanctification of the Church.' PL 172: 591C.

content of the dedication ritual has moved from the future to the past. The role of the priest as Christ has remained stable through the allegory, but in the latter section the action typologically recalls a similar action described in the Gospel. In this sense the action of the past, described in the Gospel, informs the liturgy of the present and future within the church building. The use of time to provide a layered sense of the present is articulated relatively clearly in the content of Honorius' dedication commentary; however, the same approach informs the structure of the second part of book one of the *Gemma animae*.

Structures of Allegory

As mentioned, the first book contains 243 chapters, and outlines the actions and meanings associated with the sacrificial mass and the ministers of the church. Honorius breaks the book into two sections: the first examines the actions of the priest, and the role of the creeds and prayers during the mass; the second is concerned with the church building. Honorius marks the break between these two sections at the end of chapter 121, where he writes: *Incipit de ecclesia*, and, *Haec breviter de missa dixerimus, nunc pauca de ecclesia, in qua agitur, videamus*.¹⁵⁸ The exposition of church architecture in the *Gemma animae* has never been discussed in detail, which is surprising in light of its importance for similar later texts, mentioned above.¹⁵⁹ The section on the church is formatted identically to the rest of the book, with small chapters briefly outlining the various parts of the church, and their meanings. Some descriptions and aspects of liturgy continue over several chapters, such as the description of

¹⁵⁸ 'Here we have briefly discussed the mass, now let us look at a few things about the church, in which it [the mass] takes place.' Not all manuscripts break off in the same manner, for example Cambridge, Corpus Christi College, 319., f. 113vb finishes chapter 121, then comes the rubric: *De ecclesia et altari et tabernaculo et significatione eius*. The manuscript continues with the sentence '*Haec breviter de missa etc.*'

¹⁵⁹ Indeed the section concerned with the church building is removed from Aubert Le Mire (ed.), *Bibliotheca Ecclesiastica Siue Nomenclatores VII. Veteres* (Antwerp, 1639). This work is a collection of commentaries on the mass from Augustine to Durandus.

the dedication of the church. Honorius places emphasis on different objects, and particular architectural elements which become important during the process of the dedication rite.

So far, we have outlined Honorius use of material culture, and architecture in particular, in his didactic works, as well as providing a very brief analysis of how time was thought to relate to the physical world during the Middle Ages, as well as Honorius' own theories about time. The final section in this chapter will now consider how these two ideas relate to Honorius' *Gemma animae*, and the medieval church building. The structures discussed in this section correspond to Le Goff's 'objective structures,' forming the mental framework around which the experience of the past and future takes place.¹⁶⁰ The process is enabled and underpinned by the Augustinian notion of 'immediate awareness,' or 'direct perception,' where the world experienced in the present acts as a sign for the past or future. Through a process of typological allegory Honorius describes how these 'objective structures' should have been read, and thus 'ensured better comprehension and, ideally, was able to instil a greater sense of devotion and reverence in the devout.'¹⁶¹

The order in which Honorius discusses the architectural elements of the church can be said to move outward from the altar and into the outer buildings associated with a monastery, such as the cloister and the cemetery.¹⁶² For the most part, Honorius moves west along the longitudinal line of the church, from the altar to the choir, and ending with the towers in the west. In keeping with this line, Honorius reaffirms Ohly's argument that the longitudinal axis corresponds to the temporal dimension. It is possible to track this movement by comparing the structures to those which appear in the Canterbury waterworks drawing. This is not to suggest that the author of the drawing has the *Gemma animae* in mind when drawing the

¹⁶⁰ Jacques le Goff, *Time*, p. 38.

¹⁶¹ Ruth Horie, *Perceptions of Ecclesia: Church and Soul in Medieval Dedication Sermons* (Turnhout, 2006), p. 59.

¹⁶² PL 172: 590A; GA I. 47-149.

cathedral, but Honorius addresses the text to the brothers at Canterbury, and hence, it is reasonable to expect those at Canterbury to recognise, in some way, the different structures Honorius has in mind.

The Eastern Part of the Church

The first structure to be discussed is the altar, which Honorius describes in chapters 122 – 125, where he defines its typological relationship with structures from the past. The altar is the most important structure in the church and acts as the focus of the Christian liturgy.¹⁶³ We will see that, for Honorius, the altar stands before the beginning of time, even before the creation of the world, but it allows him to conceptually move forward through time, into an early point in Christian history. The altar's presence allows the celebrant to learn about Christian history through contemporary material culture; its presence a consistent reminder of its typological link with the past and future. We have already seen that Honorius links the earliest altars described in Scripture: *Noe primus altare Domino construxisse; deinde Abraham, Isaac et Jacob altaria aedificasse leguntur, quae non aliud quam lapides erecti intelliguntur.*¹⁶⁴ In the next line Honorius draws a relationship with an earlier event in history, *Cain fratrem suum occidit, quia ignis coelestis Abel sacrificium consumpsit, suum intactum remansit.*¹⁶⁵ The altar is not explicitly mentioned in the story of Cain and Abel; however, Honorius has assumed the presence of one by the mention of sacrifices given to the Lord.¹⁶⁶ In this section the altar becomes a reminder

¹⁶³ Louis Van Tongeren, 'Use and Function of Altars in Liturgical Practice According to the *Libri Ordinarii* in the Low Countries', in Justin E.A. Kroesen and Victor M. Schmidt (eds.), *The Altar and Its Environment 1150-1400* (Turnout, 2009), pp. 261-74, p. 261.

¹⁶⁴ 'Noah constructed the first altar to the Lord; next Abraham, Isaac, and Jacob are read to have built one, which [the altars] are understood to be nothing; other than piled up stones.' Cf. Gen 12:5-7; 12:8; 13:3-4; 13:17-18; 26:25; 35:7.

¹⁶⁵ Cain murdered his brother, because the fire of heaven consumed Abel's sacrifice, and his remained untouched. Cf. Gen 4:1-16.

¹⁶⁶ Gen 4:3.

of the past, a structure which possesses a material link to the beginnings of history, and to the student's understanding of history.

In the following chapter (123), which is titled *De tabernaculo Moysi*, Honorius moves forward in time, making a direct connection between the altar in the monastic church, the altar of Moses, and the tabernacle used in the wilderness by the Israelites. The description of Moses' altar in Scripture is relatively detailed, enumerating the size and material to be used for its construction.¹⁶⁷ Honorius does not elaborate on this description; however, he uses the reference to the Tabernacle's altar to begin a description of Solomon's Temple. This change, from altar to Tabernacle, helps explain the titles of the subsequent chapters, *De tabernaculo populi* (124), *De templo* (125), *De ecclesia habente septem vocabula* (126), and *De basilica, caeterique templi nominibus* (127).¹⁶⁸ Having taken the altar in the Tabernacle as a catalyst Honorius is drawn to a discussion of the entire church. After these chapters Honorius re-establishes the structure of the *Gemma animae* by moving westward from the altar, to a discussion of the choir. This movement will be outlined in more detail below.

In the sections on the altar and the church Honorius establishes the basis of the church's typological link with the beginning of time. He writes:

Tabernaculum, quod populus in itinere habuit, formam mundi tenuit, et typum ecclesiae gessit, quae in itinere huius mundi non manentem civitatem habet sed futuram inquirat.

*Tabernaculum secundum mundum erat formatum, et elementa atque omne quod est in mundo in eo fuerat praefiguratum, quia totus hic mundus jam factus est Dei templum.*¹⁶⁹

¹⁶⁷ 'Thou shalt make also an altar of setim wood, which shall be five cubits long, and as many broad, that is four square, and three cubits high.' Ex. 27:1.

¹⁶⁸ On The Tabernacle of the People, On the Temple, On the Church which has Seven Words, On the Basilica and the other Names for the Temple. PL does not contain chapter 126, which I have not been able to find in the available manuscripts.

¹⁶⁹ 'The tabernacle, which the people had on their journey, held the form of the world, and carried the type of the church, which, in the journey of this world does not have an enduring city, but seeks the future. The

Here, Honorius uses the metonymic relationship between the Tabernacle and the church to discuss the period before the world, and hence, when time began. The quotation appears in the section about the altar, and is linked with the wider discussion about the east end of the church. In this instance Honorius may have incorporated a distinctive image from Cosmas Indicopleustes' (d. sixth century) *Christian Topography*, a work not previously noted as an influence on Honorius. In this work Cosmas conceived the 'cosmos as a vaulted building, based on a flat, rectangular earth and divided by the firmament into two superimposed spaces.'¹⁷⁰ This is an architectural image which Cosmas relates to the description of the Israelite's Tabernacle in the wilderness, even providing an image for clarification.¹⁷¹ The two spaces of the tabernacle, the *sanctum*, and the *sanctum sanctorum*, reflect the division of the heaven and the earth, an idea Honorius refers to in the section quoted. There are a number of miniatures associated with Cosmas' work which Kominko has argued are based on originals of Cosmas' design (fig. 14).¹⁷² If Cosmas has influenced Honorius' statement that the tabernacle holds the form of the world, it is not known how he could have known Cosmas' work. However, it is clear that Honorius seeks to place any mention of the formation of the world at the beginning of his discussion on the church structures.

Analogous to the section on the structure of the church, but freed from the chronological sequence, chapter 123 is not the only time Honorius mentions Moses in

tabernacle was formed according to the world, and the elements and all the things in the world were prefigured in it, because the totality of this world was already made in the temple of God.' PL 172: 584C. Cf. Heb. 13:14.

¹⁷⁰ Maja Kominko, 'The World of Cosmas : The Universe Described and Depicted in Byzantine Manuscripts of the Christian Topography' (Unpublished DPhil thesis, University of Oxford, 2006); Maja Kominko, *The World of Kosmas: Illustrated Byzantine Codices of the Christian Topography* (Cambridge, 2013). Cosmas' conclusion that the earth is flat is in contradiction to many classical and medieval authors who believed it to be a globe, Stevens, 'The Figure of the Earth', p. 273.

¹⁷¹ Kominko, 'Cosmas', p. 180.

¹⁷² Ibid., p. 1.

reference to the altar.¹⁷³ Previous to the section quoted above Honorius writes: *quando Moysi de monte descendenti diversa dona ad faciendum tabernaculum offerebat, in quo altare fiebat super quod sacerdos sacrificia populi immolabat. Sic episcopo de pulpito descendenti populi diversas oblationes offerunt, pro quibus sacerdos et ministri sacrificium in altari cum cantu immolabunt.*¹⁷⁴ The altar, in this instance, becomes a sign relative to the pulpit from which the bishop descends, creating a binary image, where one signifier becomes clear only in relation to the presence of another signifier. In this case the pulpit becomes the mountain from which Moses descends, and the altar becomes the altar he constructed there at its base.¹⁷⁵ The altar acts as a typological anchor, and sets the stage for an allegorical reading in relation to the liturgy taking place around it; specifically it helps to identify the bishop as Moses. This same binary relationship between the static altar and the celebrant moving in relation to that structural anchor can be seen in chapter 79, which is one of several titled *Mysterium*. Honorius uses this relationship in order to tell the story of David fighting the Philistines.¹⁷⁶ He writes: *Cum oblationes super altare ponuntur, quasi arma David deponuntur. Porro cum pontifex ad altare venit, quasi David adversus Philistaeum [sic] procedit.*¹⁷⁷ In this case, the static nature of the altar takes priority over the importance of the altar's role as the centre of the mass; so much so, it takes on the negative role as the enemy of the Israelites. Importantly, here we see

¹⁷³ For example, GA I.76: *Interim stat pontifex ad altare, et pro laborantibus orationem recitat, sicut et Moyses in monte pro pugnantibus orabat.*

¹⁷⁴ 'When Moses, having descended from the mountain, offered various gifts to make the Tabernacle, in which the altar was made upon which the priest used to offer sacrifices for the people. Thus, the bishop, having descended from the pulpit, the people offer various gifts, on behalf of whom the priest and the ministers offer a sacrifice on the altar with singing.' GA I. 26.

¹⁷⁵ The same can be seen in GA I.76: *Interim stat pontifex ad altare, et pro laborantibus orationem recitat, sicut et Moyses in monte pro pugnantibus orabat.* 'Meanwhile the priest stands at the altar, and recites the prayer on behalf of the labours, just as Moses prayed on the mountain on behalf of the warriors.' Here the binary relationship exists between the position of the priest to the altar and Moses standing at the altar.

¹⁷⁶ 1 Sam 17.

¹⁷⁷ 'When the offerings are placed on the altar, [it is] as if David's weapons are laid down. Furthermore, when the priest moves towards the altar, [it is] as if David advances against the Philistine [Goliath].' GA I.79.

that Honorius places emphasis on the typological links to the past; the altar is no longer Christ or Jerusalem, instead it takes on the negative guise of Goliath. The altar's primary role at this time is to remind the student of a particular event in Christian history.

The meaning of any object is not static or fixed. The most common meaning Honorius assigns to the altar is Christ, a link which occurs on eight occasions. The first occurs in GA I. 134, where Honorius writes about the floor of the church:

*Pavimentum, quod pedibus calcatur, est vulgus cujus labore Ecclesia sustentatur. Criptae sub terra constructae sunt cultores secretioris vitae. Altare, super quod sacrificatur, est Christus super quem sacrificium Ecclesiae acceptatur. Ideo corpus Christi super altare conficitur, quia populus in eo credens ex eo reficitur: unum cum Christo, quasi multi lapides unum altare, efficitur.*¹⁷⁸

The actual structure of the altar, constructed of individual stones, is used as a metaphor for the people's relationship with Christ and the Church more broadly.¹⁷⁹ As we have seen above, this architectural image, of individual stones representing individuals within the broader community of the Church, is used by Honorius in his other work, the *Elucidarium*.¹⁸⁰ This tendency to use both the process of construction as well as the individual elements which comprise complex objects is a recurrent technique in Honorius' works, and the *Gemma animae* in particular.

Continuing the sequence of the discussion of the altar directly, the image of the church being constructed from individual stones is taken up at the beginning of the chapter 125, *De*

¹⁷⁸ "The floor, which is trodden upon by the feet, is the common people by whose labour the church is sustained. The crypts constructed underneath the earth are the worshippers of the more avowedly religious life. The altar, upon which a sacrifice is made, is Christ upon whom the sacrifice of the church is received. Therefore the body of Christ is made on the altar, because the people believing in him are remade from him: they are made one with Christ, as many stones make one altar.' PL 172: 586D.

¹⁷⁹ Cf. 'like living stones, let yourselves be built into a spiritual house.' 1 Peter 2.5.

¹⁸⁰ p. 210.

*templo.*¹⁸¹ *Templum autem quod populus in patria cum pace possidebat, praefert templum gloriae de vivis lapidibus in coelesti Hierusalem constructum.*¹⁸² Subsequently, Honorius draws the discussion back to the subject at hand, *In quo altare aureum est Christus gloria sanctorum.*¹⁸³ The inclusion of the altar at this stage demonstrates that the primary object under discussion here is the altar, and not the Temple, nor the entire church building. The next chapter extends the discussion to the etymology of *ecclesia*, and any associated words. The final chapter concerned with the altar, and its wider relationship with the entire church building considers the term *basilica*: *Basileus namque rex, quasi 'basis laos,' id est 'columna populi' dicitur, quia ejus regimine fulcitur.*¹⁸⁴ Where Honorius normally uses Isidore's *Etymologiae* as a source, he has not done so in this case.¹⁸⁵ In the entry for 'basilica' Isidore makes no mention of the *basis laos*, nor *columna populi*.¹⁸⁶ Honorius seems to divert from his usual source for etymologies in order to emphasise the architectural qualities of the entire building.

Having established the main themes of Honorius' primary discussion of the altar, with its reference to the pre-made universe, and its typological relationship with analogous structures or associated events, we can now move to the wider links Honorius makes. References to the altar and other allegorical relationships are scattered throughout the

¹⁸¹ Misprinted in PL as chapter 215.

¹⁸² 'The Temple, which the people held in their native land in peace, anticipates that temple of glory built from the living stones in the heavenly Jerusalem.' Cf. Plumpe, '*Vivum Saxum*'.

¹⁸³ 'On which golden altar is Christ, the glory of the saints.'

¹⁸⁴ 'For the Basileus or king, is made up from '*basis laos*,' that is, the column of the people, because he supports his kingdom.' *Basis* is frequently used to refer to the base of a column; For example, Mortet, *Receuil*, I., p. 192.

¹⁸⁵ For example, chapter 122, on the altar *Ara vero quasi area, id est plana vel ab ardore dicitur, eo quod in ea sacrificia ardebant. Ara enim Graece dicitur, Latine imprecatio.* 'Altar is derived from *area*, that is, flat, or it is named from heat / burning, because sacrifices are burned on it. *Ara* is the Greek, the Latin is *imprecatio*.' Compare with 'Some have said that an altar (*ara*) is so called because there the kindled sacrifices burn (*ardere*). Others say it is from a 'prayer', which the Greeks call ἀρά.' Isidore, *Etymologies*, p. 310.

¹⁸⁶ Isidore reads, 'The dwellings of kings were walled 'basilicas' at first, whence they take their name, for the term βασιλεύς means 'king', and basilicas, 'royal habitations.' But now 'basilica' is the name for divine temples because there worship and sacrifices are offered to God, the king of all.' *ibid.*, p. 310.

Gemma animae, drawing the student's mind from the present to both the past and the future at different points in the liturgical calendar.

In his history of the Christian altar Joseph Braun uses the *Gemma animae* to illustrate a typical exegetical analysis of the altar from the eleventh to the thirteenth century as representing the whole church.¹⁸⁷ This overall thesis is supported by Honorius' elision of the altar, church, and Temple, discussed above. Braun provides GA I. 160 and 162 as evidence, where Honorius writes: *Post haec sacerdos digitum tingit, et crucem per quatuor cornua altaris facit. Altare hic primitivam Ecclesiam in Hierusalem exprimit. Quasi Christus crucem Pontifex super altare fecit, dum crucem in Hierusalem, pro Ecclesia subiit.*¹⁸⁸ Also, in GA I. 162: *Postea pontifex fundit oleum super altare, faciens crucem in medio ejus, et super quatuor cornua ejus, quia Christus super primitivam Ecclesiam Spiritum sanctum in Hierusalem effudit, in qua et crucem subiit, deinde per quatuor mundi partes haec dona fidelibus tribuit.*¹⁸⁹ Here the altar represents the church; however, it is not the church as it existed in the twelfth century, but the early (*primitivam*) church in Jerusalem. Honorius' objective is not to create a direct allegorical link between the altar and the church, but a typological and temporal one between the altar, as it stands in the twelfth century, and the early church as it existed in first-century Jerusalem. The altar in this case represents a moment in Christian history, a particular moment in time, which relies on the liturgy and the presence of the priest to be made explicit.

Honorius' attention moves outward to other parts of the east end. For example, chapter 128 considers the chapels (*De capellis*), and their derivation from small shrines used in

¹⁸⁷ Joseph Braun, *Der Christliche Altar in seiner Geschichtlichen Entwicklung* (Munich, 1924), p. 752. Braun does not offer an earlier example than Honorius, however.

¹⁸⁸ 'After these things the priest dips his fingers in oil, and makes [the sign of] the cross at the four corners of the altar. Here the altar represents the early church in Jerusalem. It is as if the priest making the sign of the cross above the altar is Christ going to the cross in Jerusalem on behalf of the Church.'

¹⁸⁹ 'Afterwards he pours out the oil onto the altar, making the sign of the cross in the middle of it, and above its four corners, because Christ pours out the Holy Spirit onto the early Church in Jerusalem, where he went to the cross, then he divided these gifts to the faithful throughout the four parts of the world.'

antiquity.¹⁹⁰ In the Romanesque Canterbury cathedral for example, there were two chapels located in the east end of the church, dedicated to Anselm, and Saint Andrew. Honorius re-orientates the reader toward the east of the church with the following chapter, which considers the site of the church.¹⁹¹ This chapter begins, *Ideo autem ecclesiae ad Orientem vertuntur, ubi sol oritur, quia in eis Sol justitiae adoratur, et in Oriente paradisus nostra patria esse praedicatur.*¹⁹² Underlining Honorius' association of the eastern part of the church with the early church, he ends the chapter by stating, *Sanctuarium est primitiae Ecclesiae de Judaeis collectae; anterior domus, in activa vita Deo servientes.*¹⁹³ Honorius is, again, specific about his allegorical links, the sanctuary, the eastern most part of the church, is not just representative of the church as a whole, but the primitive church. This relationship is underpinned by the orientation of the church building.

The final section which Honorius devotes to the east end is the chapter 138, and is called *De ostio* (the doorway). Previous to this Honorius described the liturgical and architectural elements immediately surrounding the altar.¹⁹⁴ In a similar manner to the chapels, any consideration of the doors may apply to every door in the church, and it is difficult to know if Honorius had a specific one in mind, such as the doorway at Canterbury.

¹⁹⁰ *Antiqui enim nobiles ecclesiolas in itinere de pellibus caprarum factas habebant, quas inde capellas vocabant, et earum custodes capellanos nominabant.* PL 172: 585D. 'Antique nobles had small tabernacles made from goatskin while on a journey, they were called chapels, and their guardians were called *capellanos*.'

¹⁹¹ *De situ ecclesiae* PL 172: 586A. The chapter considers the actual site of the church and not the process of finding or creating the site.

¹⁹² 'Churches are orientated towards the east, where the sun rises, because in them the Sun of justice is adored, and paradise, our native land, was said to be in the east.' Ibid.

¹⁹³ Ibid. 'The sanctuary is inherited from the primitive church of the Jews; the front of the church serves only the active life for God.'

¹⁹⁴ For example, the ground, the steps before the altar, and the crypt underneath it, as well as the cross placed above it.

The Choir

After the extended section on the structures and objects located in the east end of the church, Honorius moves westward to consider the choir, although not in as much detail as he considered the altar. Three chapters (139-141) examine the structure of the choir, and its typological links, as well as the structure and materials which comprise the corona (chandelier).¹⁹⁵ Honorius begins chapter 139: *Chorus psallentium a chorea canentium exordium sumpsit, quam antiquitas idolis ibi constituit, ut videlicet decepti deos suos et voce laudarent, et toto corpore eis servirent.*¹⁹⁶ Here we see that Honorius' first aim is to establish the antiquity of the choir as a place of worship, with the singing of the psalms within the specific structure set for the task (*chorea*). As indicated above, for Honorius the structures under discussion have a polyvalence, simultaneously exuding several meanings. History gives him the opportunity to explain the meanings at several different points in the past or the future. For Honorius, and it would seem his intended readership, the actions which take place in the choir are more important than the structure itself. He writes, *Salomon cantores circa altare instituisse dicitur, qui voce, tubis, organis, cymbalis, citharis, cantica personuisse leguntur.*¹⁹⁷ Having moved from linking the structure and actions of the choir with a pagan past, thus establishing an authority by way of its foundation in antiquity, Honorius moves to assert a typological relationship with Solomon, and by implication the Temple built by him. Finally, in chapter 150 Honorius moves to link the choir with the future: *Cancelli in quibus stant, multas mansiones in domo Patris.*¹⁹⁸

¹⁹⁵ The titles of the chapters are, *De choro*, *De concordia chori*, *De corona*.

¹⁹⁶ PL 172: 587C. 'The choir of psalms took its beginning from the chorus of singing which the ancients established here for idols, so that they could praise their deceiving gods with the voice, and serve them with their entire body.'

¹⁹⁷ PL 172: 587D. 'Solomon is said to have established the singers around the altar, who with the voice, trumpets, organs, cymbal, lute, songs, are read to have made a continuous noise.'

¹⁹⁸ PL 172: 588A. 'The Chancels, in which they stand, designate the many rooms in the house of the Lord.'

Here the discussion moves into the future, providing a structural analogy with the promise of the celestial Jerusalem.

Unlike in the section on the east end of the church, Honorius here defines a specific period in history in which the liturgy of the choir was established in a recognisable form, stating: *Olim namque in modum coronae circa aras cantantes stabant; sed Flavianus et Diodorus episcopi choros alternatim psallere instituebant. Duo chori psallentium designant angelos.*¹⁹⁹ Similar information appears in book three of the *Gemma animae*, where Honorius names Flavianus as bishop of Antioch.²⁰⁰ The source is Theodoret's *Historia ecclesiae* which details the history of the Arian debate in the fifth century. Theodoret describes Flavianus and Diodorus as following the 'monastic life,' but not yet being ordained.²⁰¹ They 'first divided the length of the church into two choirs, and taught them to sing the psalms of David, each choir in his course: which custom was first begun at Antioch, and came from there into all the world.'²⁰² By establishing the antiquity of the double choir, Honorius presents the structure and format of the choir as a historical entity which has continued to exist into the present. Furthermore, he emphasizes the monastic origin of the structure.

The final section on the choir moves attention upwards to the corona or chandelier which illuminated the east end of the church.²⁰³ Underlining the fact that Honorius speaks about structures moving from east to west, this chapter (141) is the second concerned with a

¹⁹⁹ 'At one time they stood around the altars in a circle, like the corona, singing; but bishops Flavianus and Diodorus established choirs to sing alternately. The two choirs singing the psalms represent the angels.'

²⁰⁰ *Flavianus Antiochenus episcopus, et Diodorus episcopus, qui primitus choros alternatim psallere instituerunt.* GA 3.64.

²⁰¹ Theodoret was a critic of Nestorius during the Nestorian controversy during the fifth century. He was a monk, although not ordained. See, *Theodoret of Cyrus*, trans. István Pásztori-Kupán (London; New York, 2006).

²⁰² Theodoret, *The Ecclesiasticall History [of] Theodoret* (Iikley, repr. 1976), 2.24.

²⁰³ John Fleming (ed.), *The Penguin Dictionary of Architecture* (London, 1991) does not list corona as a chandelier in a church. However, various texts from the eleventh and twelfth centuries clearly demonstrate that the *corona* was a chandelier. For example, Mortet, *Receuil*, p. 131, '*in cujus medio coronam invise estimationis, auro argentoque fabrefactum, desuper a laquearibus suspendit...*;' 'In the middle of which he suspended a chandelier (*coronam*) of inestimable value, made in gold and silver, and suspended it from the wooden ceiling.'

corona. Chapter 133 is titled *De corona in ecclesia*, beginning, *Lumina, quae circa capita sanctorum in ecclesia in modum circuli depinguntur*.²⁰⁴ Here the discussion centres on the corona in the sanctuary; however, the later chapter must be concerned with another corona, and only makes sense if Honorius has moved the discussion westward. The later chapter begins: *Corona ob tres causas in templo suspenditur: una quod ecclesia per hoc decoratur, cum ejus luminibus illuminatur; alia quod ejus visione admonemur quia hi coronam vitae et lumen gaudii percipiunt, qui hic Deo devote serviunt; tertia ut coelestis Hierusalem nobis ad memoriam revocetur, ad cujus figuram facta videtur*.²⁰⁵ Further on he refers to the ‘towers of the corona’ implying either there may be some architectural structure represented on the corona, or that there are parts of the chandelier which project upwards in the manner of a tower.²⁰⁶ Honorius uses the structural hierarchy inherent in an object such as the corona to promote a sequence of thought, using the process of creating the corona and its materials to provide more information.²⁰⁷

Honorius’ focus on the materials and form of the chandelier is not unique and accords with an earlier description of a similar object. Leo of Ostia, in his description of abbot Desiderius’ renovation of Monte Cassino abbey mentions the various liturgical objects he had made. Leo writes, ‘He [Desiderius] had made in the form of a huge crown of silver a chandelier,

²⁰⁴ PL 172: 586C. ‘The lights around the heads of the saints in church are depicted in the form of a circle.’

²⁰⁵ PL 172: 588B. ‘The corona is suspended in the temple for three reasons: first, through it the church is decorated, when it is illuminated with its lights; another, because we are reminded by the sight of it that those who serve God devoutly here receive the crown of life and the light of joy; third, so that seeing it brings back to our memory the celestial Jerusalem.’

²⁰⁶ *turres coronae sunt, scriptis ecclesiam munientes: lucernae ejus bonis actibus lucentes: aurum enim sunt martyres: argentum, virgines: aes, continentes: ferrum, conjugiiis servientes*. Ibid. ‘The towers of the corona, fortifying the church with Scripture, its lights lighting good works: the gold signifies the martyrs, silver, virgins, brass, those vowed to celibacy, and iron, the joining in marriage.’ It is interesting to note that perhaps, in this case, Honorius has a specific object in mind.

²⁰⁷ *Constat enim ex auro, argento, aere et ferro. Aurum sunt sapientia fulgentes: argentum, eloquio nitentes: aes, in doctrina coelesti dulciter sonantes: ferrum, vitia domantes*. Ibid. ‘It consists of gold, silver, brass, and iron. Those shining wise people are gold; glittering eloquent people are the silver; brass, is the sweet resonance in the heavenly learning; iron, the mastering of sin.’

twenty cubits in circumference and weighing about one hundred pounds, with twelve projecting towers and thirty-six lamps hanging from it. From a heavy chain of seven gilded balls, he suspended the chandelier outside the choir in front of the cross.²⁰⁸ Leo's reference to the 'twelve towers' may indicate an architectural sense to the chandelier, one that may be linked with the twelve gatehouses of the celestial Jerusalem.²⁰⁹ Both authors also mention the chains on which the chandelier is suspended including the materials from which it is made.

There is a report of large corona at Canterbury in the Middle Ages, which was described as 'carrying four and twenty lights,' a number twice as many as Honorius indicates, if he is indeed writing about Canterbury. If we compare Honorius' statement with extant examples of large scale coronae it would appear that Honorius' description accords with the *corona* at Canterbury. For example, the 'wheel-shaped Hezilo Chandelier' at St. Mary's cathedral in Hildesheim dates to 1061 and hangs above the middle of the nave.²¹⁰ This corona is circular and gilded with a silver backing, there are twenty-four places in which lights can be placed. These locations alternate between a gateway structure flanked by tower of which there are twelve, and twelve larger singular towers which alternate between circular and square top upper storeys. The chandelier is only slightly earlier in date to Honorius' stay in England, and shows twelve towers with twelve spaces in between – giving space for twenty-four lights in total. The same alternating pattern is found in the medieval corona at Aachen and a modern recreation at Buckfast abbey.²¹¹ Therefore, it remains possible that Honorius uses Canterbury

²⁰⁸ Caecilia Davis-Weyer, *Early Medieval Art, 300-1150: Sources and Documents* (Toronto; London, 1986), p. 140.

²⁰⁹ Rev. 21. 12.

²¹⁰ Martina Giese, et al., 'Hildesheim: Center of Medieval Art', in Peter Barnet, Michael Brandt, Gerhard Lutz (eds.), *Medieval Treasures from Hildesheim* (New York, 2013), pp. 3-19, here p. 5.

²¹¹ M. Q. Smith, 'Mediaeval Chandeliers in Britain and their Symbolism', *The Connoisseur*, 190 (1975), pp. 266-271, here p. 268.

cathedral as a prototype to discuss medieval churches in a wider manner, although this still only remains one possibility

In his discussion of the corona, Honorius exploits the materiality of the object to discuss several subjects using only this single object. Writing '*Constat enim ex auro, argento, aere et ferro*,'²¹² Honorius lists the allegorical significance of the different materials, of both the corona itself, and the towers of the celestial Jerusalem. Honorius goes into more detail, using the moulding process of the metals to derive more significance from the corona. He writes, *metalla in igne excocta ad ornatum coronae sumuntur, et electi in camino tribulationis probati ad coelestis Hierusalem decorem eliguntur*.²¹³ In this example, Honorius asks the reader to consider the past and production of the particular object. The corona and the material of which it is made acts as a sign for various aspects of the institutional church, but the time in which it takes to make the object itself is considered as part of the act of signifying.

The West End

The final sections of the church to be considered are located west of the choir. These are the bells and the towers, comprising chapters 142-143.²¹⁴ Honorius begins by discussing the bells themselves, following a technique used in the previous section on the corona. The bells are likened to the preachers, those 'who bring the people to the church.'²¹⁵ In chapter 142 he writes, *Ex aere sunt fusae, quod est durum et sonorum, quia praedicatio illorum contra vitia est dura, et de virtutibus est sonora*.²¹⁶ Whilst not strictly concerned with architectural matters,

²¹² GA I.141. 'It [the corona] consists of gold, silver, bronze, and iron.'

²¹³ 'The metals are tempered in fire to take on the ornamentation of the corona, and the elect, having been tested on the path of tribulation, are chosen to decorate the celestial Jerusalem.'

²¹⁴ *De campanis, De turribus*.

²¹⁵ *qui populum ad ecclesiam convocant*, PL 172: 588C.

²¹⁶ 'They are cast from bronze, because it is durable and loud, because their preaching against vices is hard, and they are loud about the virtues.' It is worth noting that Honorius envisions a church with at least two bells, implying he had a relatively large foundation in mind.

here we see the broader point of material culture being used in didactic texts. The objects themselves have a history, the process of construction forms part of the temporal structure underpinning Honorius' allegorical exegesis.

The next section is concerned with the towers, presumably those at the west end the church, marking the end of Honorius' conceptual perambulation through the building. Honorius almost certainly has the west work towers in mind when he implies in his allegorical exegesis of the structure that there must be two such towers²¹⁷ One of the distinguishing features of Canterbury cathedral, after Lanfranc's changes at the end of the eleventh century were the two western towers, described as 'curious' by Francis Woodman.²¹⁸ In the Eadwine Psalter's representation of the Canterbury there are two towers located at the west end, and it is to these that Honorius may be referring (fig. 75). His primary concern is to typologically connect the act of preaching with the sounding of the bells. Honorius treats individually the different objects which comprise the bells, the clapper, the yoke, the rope which holds the bells, as well as the rope which descends to the ground. The clapper is the language of the preacher, the chain with which it is attached to the tower tempers and moderates his language.²¹⁹ In a typological sense the preaching accords with Christ's sending out of the seventy-two missionaries to preach.²²⁰ The majority of the allegorical and typological concerns of the west end of the church are concerned with movement outside of the church, the preaching of the Gospel, as well as the preacher's role in bringing people from without inside.

²¹⁷ *Turres, in quibus suspensae sonant, sunt duae leges, quibus praedicatores a terrenis ad coelestia suspensi regnum Dei praedicatur [sic].* PL 172: 588D. 'The towers in which they [the bells] are suspended sound out; they are the two laws suspended between earth and heaven by which preachers preach the kingdom of God.'

²¹⁸ Woodman, *Architectural History*, p. 24.

²¹⁹ *Plectrum fit ex ferro, quod omnia dura domat, est illorum lingua, quae omnia adversa superat. Vinculum quo ligatur est moderatio, qua illorum lingua temperatur.* Ibid. 'The clapper is made from iron, which masters all hardships, it is the language of those who overcome all adversities. The chain is that which is bonded, it is moderation, that language of those which is tempered.'

²²⁰ Lk. 10.

Honorius has moved from the innermost Sanctuary, to the outermost point of the church both architecturally and conceptually speaking.

The final part of this section (chapter 144) is titled *De campanario*, and discusses the belfry, describing it as 'high up,' because preaching of the bells is about heaven.²²¹ This section marks the final part of the west work. Honorius goes into more detail about additions to the west tower, writing, *Non autem sine causa gallus super campanarium ponitur. Gallus enim dormientes excitat, et per hoc admonetur presbyter, gallus Dei, ut per campanam dormientes ad matutinas excitet.*²²² An example of a cockerel placed on top of the west towers is clearly seen in the Canterbury waterworks drawing. Here we see two placed on top of the towers, done in a relatively large size compared to the rest of the building. It is clear that the drawing accords with the general appearance of Canterbury cathedral, and hence that Honorius would have known that the brothers in Canterbury would recognise that he is, at this point in the text, discussing the west end of the church. The reference to the *gallus* recalls Christ's prophecy to Peter that he would deny Christ three times by the time the cock crowed.²²³ This is the final part of temporal movement westwards, which ends with Christ's prophecy being fulfilled.

In sum, Honorius' structure for discussing the objects in the church begins with the most sacred part of the building, the altar.²²⁴ Honorius' focus remains in the east end for much of the discussion and includes elements such as the windows and the columns, and the altar. Honorius moves conceptually westward, discussing the choir and the corona which provides light for the singers. Next the crossing tower, and finally the bells and weathervane at the west

²²¹ *Campanarium, quod in alto locatur, est alta praedicatio, quae de coelestibus loquitur.* PL 172: 589B. 'The bell tower, which is placed on high, is noble preaching, which speaks about the heavens.'

²²² PL 172: 589B. 'It is not without reason that the rooster is placed on the bell tower. The rooster wakes the sleeping; through it the priest, the rooster of God, is reminded early in the morning to wake those sleeping.'

²²³ Cf. Lk 22-54-62.

²²⁴ 'The (main) altar was the most important object in the church, dominating it during the liturgical celebrations [...].' see Van Tongeren, *Use and Function*, p. 261.

end are mentioned, calling the mind to remember the cock crowing just before Christ's passion. This outline provides a cyclical timeline impressed upon the structure of the church. The *gallus* of the westworks typologically refers back to the period just before Christ's passion, the latter of which is recalled in the liturgy and structure associated with the altar, and so the cycle of birth and death, Incarnation, Passion and Resurrection, Creation and Judgement, starts again with every Mass. Honorius' movement from east to west, and the associated movement in typological history concurs with several facets of ecclesiastical practice. For example, for the most part the east end of a medieval church tended to be built first, with the work moving westwards. This movement is also reciprocated in Hugh of Saint Victor's mystical ark, where the longitudinal line begins at the top (the east) and moves forward in both space and time.

Conclusion

A late twelfth-century Victorine sermon begins with reference to the structure of the church, *Habet, fratres charissimi, tabernaculum Domini, id est sancta Ecclesia [...], habet sanctuarium, habet chorum, habet navem, habet atrium.*²²⁵ The sequence offered in this sermon corresponds to Honorius' movement from east to west, a movement characterised by the building and its parts. This is not to argue that there is a direct connection between Honorius' *Gemma animae* and the Victorine author of the sermon; however, it would seem that in discussions of the church building one moves through it east to west. Similarly, Hugh of Saint Victor, the artist of Siena cathedral, and Honorius applied a temporal dimension on this movement which began in the east and ended in the west.

²²⁵ PL 177: 901A. 'It has, dear brothers, the tabernacle of the Lord, that is the holy Church [...] it has a sanctuary, it has a choir, it has a nave, and it has an atrium.'

This chapter has shown the importance of incorporating the dimension of time into considerations of medieval allegory. Typological exegesis relies on a strong knowledge of history, but Honorius uses material culture to bring the student's mind backwards into the events of history and forwards to the Last Judgement. The *Gemma animae* presents a typical church building, and uses a person's experience of it as a means to project facets of the past into the objects surrounding them. The result is an ingenious use of architecture to teach. We have shown that Honorius' use of 'didactic materialism' as a pedagogical strategy manifests itself in an abundant use of objects and structures. Architecture forms one part of this strategy which enables Honorius to effectively use the liturgy to consistently remind the student of history and of the world to come. By incorporating the fourth dimension of time into Honorius' emphasis on his environment I hope to have demonstrated that allegorical and typological exegesis could be given a dynamic aspect, one which is rooted in the movement from east to west, using a static building to model the past, present, and future of the believer.

Conclusion

This thesis has presented a relatively large number of architectural drawings, and interpreted them in terms of their dimensionality. Two-dimensional drawings provided a framework for indexing datasets, three-dimensional representations presented a form of physical reality to the reader, and four-dimensional drawings allowed for a link to be formed between the present and the past. This is not to imply that each dimension is mutually exclusive from one or more of the others. Two-dimensional canon tables may be typologically linked to a four-dimensional Jewish or Christian past as a historical commentary; Richard of Saint Victor's three-dimensional *In visionem Ezechielis* could also be interpreted in four dimensions or two. It is the nature of architectural representation that it manifests itself in multiple dimensions simultaneously. However, by examining architectural representations as dimensional objects, as this thesis has attempted to do, it becomes clear that the images and textual creations yield knowledge about themselves and contemporary attitudes to the built environment. By examining architectural representations in terms of their dimensional properties we have discovered something new: that the use of architecture in particular contexts is not an arbitrary choice.

Chapter one examined architecture's role in literally structuring information to form comprehensive datasets within quadrivial texts. The complicated technical bases for arithmetic, music, geometry, and astrology encouraged medieval *magistri* to teaching with picture as well as words; with the concrete as well as the abstract; indeed, to use the concrete nature of architecture to make the inherently abstract qualities of numbers more easily understood. Structuring information in architectural frameworks is different from enclosing

information in other types of organisational schema, such as *arbor* or *rotae* diagrams. In terms of iconography, architecture presents information about the natural world which, having arisen out of obscurity and seeming chaos, has been placed within an ordered context by the teacher. Formally speaking, architecture allows for the efficient representation of hierarchical relationships between *genus* and *species* in a manner that *arbor* and *rotae* diagrams do not. For example, the canon tables display information about the pericopes between gospels in the tympanum of the architectural frameworks, while the specific part of the text is displayed in the columns below: the columns of the architecture become the columns of figures that allow us to find our way around the Gospels

This type of organisational scheme appears in two dimensions – length and width – as demonstrated by texts which orientate the reader around the figures. There is no attempt, and there is no need, to identify the architectural structures in quadrivial texts as three-dimensional objects. Isidore of Seville's *rotae* diagrams are simple constructions which convey abstract, and frequently lateral, relationships between entities, objects, or events; in a similar manner two-dimensional architectural representations are an elaborate version of this scheme, but one which holds iconographical resonance; namely the ability of the teacher or artist to create order out of chaos.

Chapter two examined how architecture is recreated in three dimensions, specifically in Richard of Saint Victor's *In visionem Ezechielis*. The diagrams Richard includes, and makes reference to, contain an important didactic function, because they visually display what is described in the text. Here, Richard seeks to express a three-dimensional structure on a two-dimensional page; and we have seen how, by following this methodology, Richard created the first confirmed sectional elevation in the history of architectural drawing. Richard explains the height of the gatehouse by enumerating the height of the different floors; the diagram echoes

this approach and allows the reader and viewer to see the interior of the structure, as if the wall had been removed. Three-dimensional architecture is rooted in the medieval conception of reality; one which identifies the solid and perceptible world with entities and objects which contain three dimensions. Richard, by taking great pains, re-creates Ezekiel's vision in front of the reader. Recognising that the slope of the mountain would affect the lengths of the buildings, Richard devised an ingenious and sophisticated solution to provide a key to read these lengths as being *in planum* or *superficie*, that is, either flat or inclined, reflecting the reality of the prophet's experience.

Chapter three introduced the dimension of time to examples of architectural representations. Honorius Augustodunensis' *Gemma animae* uses the elements and fabric of a medieval church to retell Christian history. The 'church' Honorius describes inherently exists in three dimensions because Honorius discusses parts of the church which are present in nearly all examples. By using architecture to teach the laity about the past, by means of the liturgy, Honorius takes advantage of a pedagogical strategy which was described in the first two chapter, namely one which used architecture to give abstract ideas a tangible form. Working in a three-dimensional church, Honorius nevertheless introduces the fourth dimension, time, to show how Christian history moves from Creation to Redemption, a history that is played out in the Mass and in the elements of the church building.

A number of conclusions can be drawn from this material. In the first instance, presenting architectural representations as separate from the concerns of the development of technical drawings has provided a rich description of the role they play in medieval intellectual culture. Architecture was a common sight in medieval manuscripts, though not in the plainly literal way that histories of technical drawing imply. The examples employed here, though only scratching the surface of what could have been used, help to demonstrate that the form

in which architectural elements were presented, such as with a disregard for structural integrity, facilitated the medieval artist in placing sets of data or information within architectural forms without having to provide an equivalent to a physical building, or even some specific structure. This means that attempts by some scholars to identify the canon table representations as 'mystical' are wide of the mark. The representations have no real-world counterpart, they are simply a collection of architectural forms brought together to create a framework for data.

Mary Carruthers' work on the relationship between architectural descriptions or representations and medieval mnemonics has been a predominant theme in recent studies of architectural representations. According to this theory, the most common architectural representation, the Gospel canon table, was created for a mnemonic purpose. This may not completely describe the situation. Hugh of Saint Victor created a two-dimensional grid-like system for indexing the psalms. In this case the psalms were already memorised by the student, but Hugh described a way of ordering the material so it could be accessed quickly. If we accept the links between Hugh's system and the two-dimensional architectural representations discussed in the first chapter, it would appear that architecture was used to index datasets of numbers or other pieces of information. The system could have been used to remember that data, but it would appear that the act of committing data to one's memory and ordering it are two separate steps, and indexing data does not necessarily mean it was created to store in the memory. The potential of Romanesque drawings to represent architecture in a non-structural manner allowed for the creation of an expedient system for indexing diverse material, separate from any conception of memorisation. Medieval scholars may or may not have wanted to memorise the material contained by these drawings, but they certainly wanted to order and index it; architecture was used for those purposes whether or not memory was to play a part.

Richard of Saint Victor's *In visionem Ezechielis* illustrates the emergence of a growing concern for accurate measurements in the twelfth century, a theme which would develop in subsequent centuries. Richard pays attention to an entire set of structures, which is unusual in Romanesque texts about architecture. In order to demonstrate the appearance of the buildings in Ezekiel's vision, Richard provided a series of architectural drawings which appear similar to modern technical drawings. Nevertheless, Richard's aim in presenting these careful drawings is not the same as that of a modern draftsman or even a medieval mason. His concern with the practicality of Ezekiel's descriptions goes beyond whether or not it could be built, to showing that, in describing a practicable, achievable Temple complex, Ezekiel was correctly representing the truth of God's word, channelled through the prophet. In his attempt to persuade his readers of his historical description, Richard drew one of the first sectional elevations. Richard was also the first to use the term *planum* or 'plan' to describe a ground-plan drawing. This evidence hints at the development of representational paradigms which became much more common in the thirteenth century, apparent in Villard de Honnecourt's portfolio. Richard's work also helps us to understand the nexus of twelfth-century historical exegesis and how physical reality was perceived and created by medieval authors.

The final chapter proposed that time is an important element in allowing medieval material culture to be used as a pedagogical tool. In the chapter I proposed a new way of understanding medieval pedagogical strategies, which I call didactic materialism. The purpose of creating this term was to illustrate that medieval teachers were aware that different students learned best through different modes, as hinted at by Aelred of Rievaulx and Hugh of Saint Victor. More specifically, didactic materialism attempts to demonstrate that one important mode of learning was by touch, or *per corpuscula*, where contemporary material culture was used to help the student understand complicated and abstract ideas. The use of didactic

materialism, as defined in the third chapter, appears throughout this thesis, demonstrating that architecture and its representations had an important role to play in the education of the medieval student. The reason why architecture was chosen to frame datasets, such as the canon tables or other quadrivial texts, was because it provided a reference to a monumental form, echoing the largest structure in the contemporary environment. Architecture is an inherently tangible object. In a similar manner, Richard of Saint Victor recreates historical reality by describing all three dimensions of the buildings in Ezekiel's vision.

Didactic materialism may provide a new way of interpreting medieval school texts, texts which were created alongside emerging medieval pedagogical strategies. It may be useful to examine other texts, not focused on architectural representations but firmly grounded in material objects, for further evidence of such didactic materialism. During the twelfth century, authors other than those discussed in this thesis included objects and extended description of objects in their work. For example, Alexander Neckham's (d. 1217) *De utensilibus* presents 'the principle operations and professions of life [which] are enumerated and described in a familiar style.'¹ The work presents these professions and descriptions with an Anglo-Norman gloss, allowing the reader to associate meanings between the Latin and Anglo-Norman. By following this format Neckham uses elements of material culture for the express purpose of educating students. John of Garland (d. 1255) also follows the same technique in his thirteenth-century *Dictionarius*.² This work was primarily intended for school children as a way of learning Latin. John takes the reader through the streets of Paris, describing the people and objects in the environment. By using contemporary material culture, Neckham and Garland use physical objects and their representations in their texts to allow the reader to consider the objects as

¹ T. Wright, *A Volume of Vocabularies* (Liverpool, 1882), p. x.

² John de Garlande, *The Dictionary of John de Garlande*, trans. B. B. Rubin (Kansas, 1981).

physical entities. Both these texts were part of the wider use of didactic materialism, which can only be briefly described here, but which would warrant further study

In sum, this thesis has offered an explanation and methodology of how the myriad of medieval representations of architecture before the birth of formal technical drawing might be interpreted. Architecture represents order which has arisen out of chaos, allowing the medieval author and artist to index a variety of material, and reassure the reader that such order is indeed possible. Moreover, the representations present a tactile or physical object to the viewer, allowing the reader to associate abstract concepts with the physical world. In doing so, invisible objects come into the perceptible realm. The large number of architectural representations in medieval manuscripts point to their importance, and this thesis has offered a fresh interpretation of why this might be.

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