THE SQUARE CHEVET OF LAON CATHEDRAL

by

REBECCA AVERY SMITH

(Under the Direction of Stefaan Van Liefferinge)

ABSTRACT

The cathedral of Notre Dame in Laon, France, represents an unusual example of French Early Gothic architecture. Until ca. 1205, Laon Cathedral incorporated a conventional French Gothic design including a round chevet after which the chevet was dismantled and reconstructed with a square design. To date, scholarship has not offered a convincing explanation either for the change in the chevet or for the adoption of such a non-traditional design. Evidence from the history of the cathedral's construction suggests that the chevet was rebuilt in between the stages of the crossing tower's reconstruction. Given the scarcity of crossing towers within Early Gothic cathedrals, it is possible that the canons were concerned about the structural stability of their tower and chose to build a square chevet as a precaution. Laon may have copied an English Gothic model, where crossing towers and square chevets were common, as a precedent for the new design.

INDEX WORDS:Gothic architecture, Laon Cathedral, Square chevet,Crossing tower, Romanesque influences, English Gothic

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INTRODUCTION

The Gothic architectural style spread through Europe affecting many different regions over a period of close to four hundred years. As a result, the study of Gothic architecture can be difficult. Gothic structures are often grouped into sub-styles according to region and relative time period, creating a variety of different types of Gothic such as the French Rayonnant, the English Perpendicular, or the Early Gothic. In the nineteenth and twentieth centuries, many scholars began to consider isolated Gothic structures, and thus the different sub-styles within Gothic architecture became further segregated.¹ This led to the perception that the Gothic style was a simple chronological development, and made the stylistic exchanges between these regions easier to ignore. The problem with this more limited approach is that buildings that could be termed transitional, those belonging to two or more sub-sets, are easy to forget. Furthermore it does not adequately explain the complex development of Gothic architecture as it was in reality, with interchanging sources and a history which we still do not fully understand today.² In part, the genesis of these categorizations is due to the nationalistic tendencies of nineteenth-century scholars and admirers of Gothic architecture who coined the terms.

Scholars of Gothic architectural history, both from the nineteenth century and today, will focus on examples which hail from their native countries. It is unsurprising. Not only are buildings and sources more easily accessible, but there is a sense of pride and familiarity in studying national monuments. Many of the great Gothic scholars of the twentieth century and

¹ Until recently, the monograph has dominated scholarship and promoted the idea that each cathedral can be considered individually and that it falls into a particular sub-category of Gothic architecture.

² The process of how art and architecture develop gradually over time with mixed exchanges and sources of inspiration is the subject of Marvin Trachtenberg's recent publication, *Building in Time: From Giotto to Alberti and Modern Oblivion* (New Haven: Yale University Press, 2010) as well as many of his other articles and books.

today focused their research efforts on their individual architectural heritage. Additionally, many scholars in the past have associated themselves with one particular region or sub-style of Gothic architecture and keeping their research scope narrowed to a single country, region, or period. It has only been within the last few decades that Gothic scholarship as a whole has begun to reflect the nature of Gothic architecture as a style with many different sources of artistic exchange that easily crossed geographic and chronological boundaries.

Gothic scholarship, as well as the admiration of the style, has a long history of nationalism. The application of the term "gothic" itself was intended as a slur against the various tribes of Goths who were blamed for the fall of Rome.³ With the rise of Romanticism in the early nineteenth century, people began to consider the medieval era as a utopian ideal exemplifying heroism and chivalry.⁴ In accordance with the renewed interest in medieval society, scholars clamored to identify the Gothic style with their own individual nations.⁵ With Gothic scholarship's nationalistic history, it is no surprise that modern scholars often followed in the same pursuit and study what they saw as their national heritage.

Recently there has been a surge in scholarship which examines broader themes and looks at Gothic as a fluctuating style whose design aesthetics overlap from region to region.⁶ This new method allows buildings which belong to multiple sub-styles to be studied and more accurately

³ Paul Frankl, *Gothic Architecture*, ed. Paul Crossley (New Haven: Yale University Press, 2000), 314.

⁴ Norman Cantor, *Inventing the Middle Ages: The Lives, Works, and Ideas of the Great Medievalists of the Twentieth Century* (New York: William Morrow and Company, Inc., 1991), 28-29; Elizabeth Emery and Laura Morowitz, *Consuming the Past: The Medieval Revival in Fin-de-Siècle France* (Aldershot, England: Aldershot, 2003), passim.

⁵ England, France, and Germany all competed for the rights to claim the invention of the Gothic. For example, English medievalists at the turn of the nineteenth century were eager to claim the Gothic style as their own and renamed the style "English" citing that they were the inventors of the pointed arch while German fans like Johann Wolfgang von Goethe, linked the invention of the Gothic with Germany. All the while France insisted that they could proclaim the invention of the Gothic- a fact with which modern scholars agree frequently citing Saint Denis in Paris as the start of the Gothic in ca. 1140. For example, see Viollet-le-Duc's *Dictionnaire Raisonné de L'Architecture Francaise du XIe au XVIe Siècle*.

⁶ For instance, see Christopher Wilson, *Gothic Cathedral* (London: Thames & Hudson, 2000), passim.

explains the style as a complex progression with many different models. The methodology used in this thesis follows this new trend as I study the exchange of architectural designs between regions-specifically those belonging to England, Normandy, the Scheldt, and Picardy. However, in order to focus my research, the primary goal of this thesis is to discuss the specific effects of these exchanged influences on the use of crossing towers in Gothic cathedrals. My case study is Laon Cathedral, particularly the crossing tower at Laon Cathedral and how the tower may have impacted Laon's design (Figs.1-5).

Laon Cathedral, begun ca.1160, featured a Latin-cross plan with a rounded chevet and four-story elevation (Fig. 2). In the first design of Laon, the cathedral's most uncommon feature was the lantern tower which still hovers over the crossing at the intersection of the nave, the transept, and the choir (Fig. 5). Crossing towers were frequently used in Romanesque buildings but had been largely abandoned with the rise of the Gothic building style.⁷ Around 1205, the builders halted the tower's construction part-way through and rebuilt the original round chevet, extending the choir and adopting a flat terminal wall, before completing the crossing tower (Fig. 3, 4). The rectangular shape of Laon's second chevet design is rare in France and a distinctly English Gothic feature. The unconventional combination of a French Gothic cathedral paired with an English chevet has long puzzled architectural historians, leading to many theories ranging from a structural problem in the original chevet to the desire to have a cohesive and unified interior.⁸ However, neither the presence of the crossing tower nor the suspicious pause in the tower's construction have ever been considered as having a role in the reconstruction of the

⁷ Romanesque architecture is traditionally thought of as the style which preceded Gothic; however, many Gothic buildings incorporate elements which are characteristic of the Romanesque. In addition, the Romanesque continued to thrive throughout the twelfth century while Gothic buildings were also being constructed.

⁸ William Clark suggested that the chevet's rectangular design was meant to continue the cohesive feel already present in the cathedral's nave and transept. William Clark, *Laon Cathedral:The Architecture*, vol. 2 (London: Harvey Miller Publishers, 1987), 61-63.

chevet. In my thesis, I argue that the crossing tower played a substantial role in the adoption of the English-styled chevet.

In this endeavor, I will discuss the role of the crossing tower in the change in chevet design at Laon cathedral by looking at the history of crossing towers, structural problems common within towers, and the specific tower at Laon. Given the halt in the tower's construction, it is possible that the Laon canons were concerned about the structural stability of the crossing tower and adopted an English style design in hopes of buttressing the tower and preventing any future collapses.⁹

In chapter one, I will explain the history of the cathedral and the different theories which have been suggested regarding the reconstructed chevet design. I will also detail the building history and the evidence of the original chevet design. Then in chapter two I will discuss the impact of Norman Romanesque architecture, particularly of Saint-Étienne in Caen, Normandy, and Tournai Cathedral, in southern Belgium, whose designs most likely were a major source for Laon. Chapter three will explain frequent structural problems which are common in crossing towers. I also will consider documented historical concerns about the stability of towers and discuss specific tower collapses showing that the concern was a relevant and widespread phenomenon. Finally, in chapter four, I will explain the English tradition of combining a rectangular chevet and a crossing tower to suggest that the rectangular design of Laon's chevet was based on English precedents.

Laon Cathedral and its unusual reconstructed chevet provide a case study for the use, role, and concerns regarding crossing towers and how such towers could impact the design of the cathedral. Scholarship has largely ignored the role that Gothic crossing towers had in cathedral

⁹ There is no evidence of any structural problems in Laon's crossing tower nor have there ever been. I suggest that the Laon canons were only concerned about the possibility of the tower collapsing and reconstructed the chevet as a precaution.

design. Instead, scholars often choose to focus on historic circumstances surrounding the construction of a cathedral or the individual decorative and architectural components within cathedrals. The prevalence of crossing towers in the Romanesque and the sudden drop in frequency in the Gothic style has never before been fully considered or explained. In addition to offering an explanation for these two voids in Gothic scholarship, I hope that by studying the role of the crossing tower in Laon Cathedral, new research avenues will be available for exploration and that I might instill a renewed interest in the structural aspects of Gothic cathedrals and how structure often affected the design within those cathedrals. There are many unanswered questions regarding the transition from the Romanesque to the Gothic styles and Laon is an example of such a transition. The study of Laon's architecture and the unusual circumstances surrounding the reconstruction of structure and design within architectural history.

CHAPTER 1

A REVIEW OF THE CATHEDRAL

The cathedral in Laon is an exceptional example of Early Gothic building. The chevet departed from the French tradition with its adoption of a rectangular eastern arm, characteristic of a distinctly English style of Gothic architecture (Figs.1-3). It also featured a lantern tower over the crossing which is rare in Gothic buildings, even more so in the Early Gothic period (Fig. 4). Crossing towers were a prominent element throughout the eleventh and twelfth centuries, particularly in Norman and Burgundian Romanesque. In the second half of the thirteenth century, many Gothic buildings in these same regions revived lantern towers as a dominant feature of their skylines.¹⁰ However, crossing towers never became common in the Ile-de-France or Picardy, and crossing towers were especially rare in the Early and High French Gothic styles making Laon's lantern remarkable. Despite the singularity of the crossing tower as well as the architecture of Laon in general, little scholarship has been written which discusses its architecture specifically. Instead, the majority of the literature has focused on the extraordinary sculptural program on the west façade.¹¹ This is unsurprising; the western façade of Laon

¹⁰ Several cathedrals built crossing towers in the second half of the thirteenth century including Rouen, Bayeux, and Dijon. Given the strong history of crossing towers in these regions, it is likely that the use of crossing towers in the later Gothic styles there was a reflection of a regional taste. For the use of crossing towers in Gothic Normandy see Lindy Grant, *Architecture and Society in Normandy: 1140-1270* (New Haven: Yale University Press, 2005) 195-197. For a discussion of crossing towers in Burgundian Gothic, see Robert Branner, *Burgundian Gothic Architecture* (London: A. Zwemmer Ltd., 1960), 44-47; 54-58.

¹¹ For information regarding the sculptural program on the west façade of Laon see Iliana Kasarska, *La Sculpture de la Façade de la Cathédrale de Laon: Eschatologie et Humanisme* (Paris : Picard, 2008), passim; Dany Sandron, "La cathédrale et l'architecte: à propos de la façade occidentale de Laon," 133-150. For a history of the city of Laon, see Alain Saint-Denis, *Apogée d'une cité : Laon et le Laonnois aux XIIe et XIIIe Siècles* (Nancy : Presses Universitaire de Nancy, 1994) 50-90.

program. While other contemporary facades such as those at Saint Denis or Chartres feature more segregated iconographic scenes, the cathedral of Laon showcases a single, unified theme which spills over the buttresses and unites the entire western end—from the north to south and from ground to the heavens. This cohesion is also reflected on the interior by the architecture featured within the Latin-cross plan.

Unified organization is characteristic of the entire cathedral, the architecture included. The length of the reconstructed chevet is a mirror image of the nave, with the same number of bays, same elevation, and a rose window terminating the choir identical to the one which lights the west façade (Fig. 6). The unusual cohesion led William Clark to theorize that the change in chevet design was intended to emphasize the balanced plan and overall unity which encapsulates the spirit of the cathedral as a whole.¹² Clark is one of the few scholars who have studied the architecture of the cathedral, and although his focus is not on the change in chevet design, he posits that the reconstruction of the chevet is a result of a general desire to have a completely unified space.

Jean Bony, among others, said that one of the key elements of Gothic architecture is a sense of openness and balance.¹³ While examining the interior of Laon, there is an overwhelming sense of cohesion (Fig. 4). The rhythms created by the repeated bays and the articulation of the colonettes are underscored by the string courses which unite each individual vaulting unit. The horizontal string courses run over each cluster of pilasters in multiple bands ascending to the clerestory and creating a fused quality that unites the cathedral both horizontally and vertically.

¹² William Clark, *Laon Cathedral: Architecture*, vols. 1 & 2 (London: Harvey Miller Publishers, 1987), passim . ¹³ Jean Bony, *French Gothic Architecture of the 12th and 13th Centuries* (Berkeley: University of California Press, 1983), 62-63. Peter Kidson discussed rhythms and measurement found within medieval architecture at length in his dissertation, "Systems of Measurement and Proportion in Early Medieval Architecture" (PhD diss, Courtauld Institute, 1956) and should be mentioned as a significant resource. Unfortunately, I was unable to procure a copy of his dissertation which still remains unpublished.

The mirrored nave and choir, and twin transept arms oscillate around the crossing illuminated by a lantern tower, which Clark argues is the center and focus of the cathedral, creating the unified view.¹⁴ However, a choir screen would have blocked the long view of the unified church. Today instead of the original medieval choir screen, there is an eighteenth-century, gate-like element made of iron through which a visitor can easily observe the choir and witness the symmetry created by an identical chevet (Fig. 6). The original medieval choir screen would have probably resembled a wall of sculpted marble which would have stopped any clear view into the chevet itself (Fig. 31). Additionally, it is unlikely that the chapter would condone such a costly endeavor without more substantial reasons. I suggest that the cohesion was an effect of the shift in chevet design, rather than a cause—an unexpected boon upon realizing that the chevet needed to be changed for structural or functional reasons.

Logistical reasons behind the change in chevet design have also been suggested by Alain Saint-Denis. Saint-Denis argues that the design was changed because the liturgical practices needed more space.¹⁵ When the Laon canons practiced the liturgy, it often spilled into the nave because the choir was too small and crowded. This could easily explain why the choir was extended to the same length of the nave; instead of the original three bays, the new rectangular chevet has ten. Saint-Denis's idea is further supported by a study of the compound pier design of the nave conducted by Eric Fernie. Fernie's research found that the construction of the nave halted between the fifth and sixth bays of the nave and was extended in length to accommodate a large cross placed just before the choir screen.¹⁶ Between 1170 and 1228, it was common for

¹⁴ Clark, *Laon Cathedral*, vol. 2, 61-63.

¹⁵Alain Saint-Denis, Martine Plouvier, and Cecile Souchon, *Laon : La Cathédrale* (Paris : Editions Zodiaque, 2002), 100.

¹⁶ Eric Fernie, "La Fonction Liturgique des Piliers Cantonnés dans la Nef de la Cathédrale de Laon, " *Bulletin Monumental* 145 (1987): 258.

large crosses to be placed west of the choir screen and used in the liturgy as was discussed in a treatise, *L'Ordinarium Ecclesiae Laudunensis*.

A large ceremonial cross placed in the eastern section of the nave or in the crossing would crowd the space for the laity and indicate a need for a larger choir. At the least, the display of such a prominent object in the crossing emphasizes the importance of the space both architecturally and liturgically.¹⁷ The significance of the crossing underscores the importance of the tower above it because the tower draws the attention to the space and balances the church, as mentioned by Clark and Fernie. It is therefore of no surprise that crossing towers were popular throughout the middle ages as a means of accentuating the sacred space by visually linking it with the heavens above. However, as Robert Bork argues, in the thirteenth century, there was a sharp decline of the construction of spires and towers.¹⁸

It has been argued that the presence of crossing towers, and towers and spires in general, became less popular in thirteenth century due to financial crises which plagued France.¹⁹ With the increasing number of commune revolts and the rising dominance of the bourgeois class, less money was donated to church building projects because they were seen as an activity expressive of aristocratic wealth. Furthermore with the mounting costs associated with the revolts, churches themselves often lacked the money to finish their architectural goals. The city of Laon does not seem to be affected by this problem; instead the city flourished financially throughout the twelfth and thirteenth centuries despite its own revolt in 1112.

¹⁷ Ibid, 260.

¹⁸ Robert Bork, *Great Spires: Skyscrapers of a New Jerusalem* (Cologne: Kunsthistoriches Insitut der Universtät Köln, 2003), 18.

¹⁹ Ibid.

Construction of the Cathedral

The bishopric at Laon was established at the end of the fifth century by Remigius, archbishop of Reims, and has since been a wealthy city with ties to the agricultural community and trade routes.²⁰ The first church constructed on the site of Laon Cathedral was built during the Carolingian era before it was replaced in the late eleventh century.²¹ However the newly renovated church was short-lived because it burned as a result of the Commune Revolt which lasted from 1112-1113. Commune revolts became increasingly pervasive throughout the twelfth century in France and often led to the abandoning of church building projects because the revolutionaries did not support the donations of money to the aristocratic clergy.²² In 1113, the Laon canons conducted two tours through northwest France and through southern and western England and Wales in order to raise funds for the rebuilding of the church.²³ It is possible that Bishop Gaudry of Laon's decision to take Laon's relics on several fundraising tours was in part an effort to save the relics from the town's revolutionary activity. Although significant funds were raised on the tours, the canons chose to wait to rebuild the cathedral until the middle of the twelfth century.²⁴

Laon Cathedral was built beginning in ca.1160 and consists of five major building phases finally finishing construction around ca.1220 (Figs. 1-9).²⁵ Construction began in the original

²⁰ Alain Saint-Denis, *Apogee d'une Cité: Laon et le Laonnois aux XII et XIII Siècles* (Nancy: Presses Universitaires de Nancy, 1994), 47.

²¹ Clark, *Laon Cathedral*, vol. 1, 14.

²² Bork, *Great Spires*, 28.

²³ Suzanne Martinet, *Montloon: Reflet Fide'le de la Montagne et des Environs de Laon de 1100 à 1300* (S.I.: Impr. Du Courrier de L'Aisne, 1972), 13-19.

²⁴ Clark, *Laon Cathedral*, vol. 1, 15.

²⁵ Clark, *Laon Cathedral*, vol. 1, 29. Clark bases almost all of his dates regarding the construction of Laon Cathedral on the sculptural style of the bosses and column capitals. For a full history of Laon Cathedral, see Clark, *Laon Cathedral*, vol. *1*, 28-54. In the thirteenth and fourteenth centuries, some chapels were added to the nave and choirThe cathedral's architecture remains largely unrestored. There was a significant amount of restoration completed on the west façade of Laon in the 19th century by Émile Boeswillwald and the Parisian sculptor Georffroy Dechaume. For more information regarding the restoration of the west façade, see Cecile Souchon, "Les

round chevet and moved westward. The first chevet consisted of three straight bays followed by a hemicycle with five radiating chapels. Although none of the original clerestory windows remain, the fragments of the responds on the third bay of the choir suggest that the stories of the first chevet were the same height as the current stories as well as provide evidence of the original chevet plan (Figs 8-9).²⁶ The completion of the west facade towers has been dated to ca. 1195 suggesting that the transept was finished around ca. 1175 before the nave's construction in ca. 1180/1185.²⁷ With the construction of the transept and the crossing, the lantern tower was built up to the height of the windows as evidenced by the style of the capitals at the tops of the crossing piers, however the tower was not completed at this time.²⁸ The reconstruction of the chevet has been connected to a donation of a stone quarry in ca.1205 and is thought to have been finished around ca.1220. Following the construction of the rectangular chevet, two chapels were added to the north and south transept arms on the east side, known today as the treasury and the sacristy.²⁹ A large chapel was then added to the easternmost bay on the south side of the cathedral. The west tower on the north transept has been dated stylistically to the mid-thirteenth century. Finally, the crossing tower was finished and vaulted after the reconstruction of the chevet as is suggested by the similarity between the decorative and structural components of the upper portions of the tower's vaulting and colonnettes, and the new square chevet (Fig. 5).³⁰ This

Restaurations Apportées à la Cathédrale de Laon au XIX Siècles," *Memoirs* 29 (1984):47-68. The stained glass in the choir was also restored in the nineteenth century after an explosion in 1870. For more information regarding the stained glass in the chevet and its restoration, see Claudine Lautier, "Les Vitraux du Chevet de la Cathédrale de Laon," *Osterreichschiche Zeitschrift fur Kunst und Denkmalpflege* 54 (2000): 257-264.

²⁶ Ibid, 36.

²⁷ Ibid, 52.

²⁸ Ibid, 33.

²⁹ Ibid, 49-50.

³⁰Ibid, 44.

halt in constructing the tower at Laon might imply that the builders became aware of the potential structural problems at some point during construction.³¹

The fact that the chevet's reconstruction occurred between the phases of the lantern tower's completion indicates that the new square chevet may have been intended to buttress the tower in order to prevent any structural problems. The date of the chevet change was concurrent with a major moment in Norman history-when Normandy was reclaimed by the French and lost all of its English control.³² The connection between Laon Cathedral and Normandy is important because it is probable that the crossing tower was modeled after the Norman Romanesque crossing tower at Saint Étienne in Caen, Normandy.

³¹Ibid, 38.
³² Grant, Architecture and Society, 1.

CHAPTER 2

ROMANESQUE SOURCES IN LAON CATHEDRAL

While impressive, crossing towers were difficult and often dangerous to build securely. Within Romanesque buildings, crossing towers would often be placed over thick walls and compound piers. At Laon Cathedral, in contrast, the structure supporting the stocky lantern tower is Early Gothic with thinner walls (Figs. 4, 5). It is likely that the master masons were still experimenting with the still-developing style, and did not fully grasp the limitations of Gothic structures. Therefore, they would not be aware of the potential danger in placing a tower over a Gothic crossing until they began construction. The fact remains that Laon was one of the few Gothic cathedrals that featured a crossing tower, and is the only example of an Early Gothic building to incorporate a crossing tower. Laon's crossing tower is an example of the considerable impact of Romanesque architecture on the design of the cathedral, including sources from Norman Romanesque and from the Scheldt.

Unlike Early Gothic structures, crossing towers were prevalent throughout the Romanesque, especially in Norman buildings. When the crossing tower at Laon is examined visually, the source is most clearly William the Conqueror's abbey church of Saint-Étienne in Caen, Normandy (Figs. 5, 10). Both towers feature a star-shaped series of ribs surrounding a central boss ring of masonry.³³ Both towers have multiple levels with an arcade and a clerestory.

³³ The crossing tower at Saint-Etienne in Caen collapsed in the seventeenth century and was reconstructed shortly thereafter. The current tower closely models the original design and still indicates that the Caen tower was probably a source for the Laon tower. The exterior of the lower, square portion of the tower is from the eleventh century; however, the octagonal superstructure is from the seventeenth century. Inside the tower, the lower level of the decoration and the crossing piers are original, while the window level and vault dates from the seventeenth century. For more information about the crossing tower at Saint-Etienne at Caen and the seventeenth-century restorations,

Therefore, it is possible that Saint-Étienne, as well as the Norman building tradition from the eleventh and early twelfth centuries, was one of the major sources of inspiration for Laon Cathedral. While I have discussed the lack of scholarship surrounding the architecture of Laon Cathedral, there is an abundance of publications which discuss the impact of Norman architecture on the Gothic style.

Arguably, the canonical text that discussed the impact of Norman building on the Early Gothic was Robert Branner's article, "Gothic Architecture 1160-1180 and Its Romanesque Sources."³⁴ Furthermore, Jean Bony and Lindy Grant both described the transportation of rib vaulting from England to the Gothic tradition via Normandy.³⁵ Eric Carlson examined the possible sources for the origin of the four-story elevation which became prevalent in the Early Gothic period.³⁶ Although each of these scholars when describing the Norman impact on Early Gothic building mention that the lantern at Laon Cathedral was reminiscent of Norman architecture and clearly borrowed features directly from Norman style churches, none addressed the possible effects stemming from placing a Norman-like tower in an Early Gothic structure. Likewise, the scholars who have written about Laon's architectural history mention the crossing tower in passing, but failed to fully acknowledge its rarity or impact on the cathedral.

This chapter will discuss Laon's crossing tower and to what extent Romanesque architecture was used as a model for Laon Cathedral. First, I will explain the political connections between Normandy and France and how these interactions perpetuated architectural exchange. Next, I will examine the Romanesque inspired elements of the cathedral including the

see Eric Carlson, "The Abbey Church of Saint-Etienne at Caen in the Eleventh and Early Twelfth Centuries" (PhD diss., Yale University, 1968), 210-213.

³⁴ Robert Branner, "Gothic Architecture 1160-1180 and Its Romanesque Sources," *Studies in Western Art: Acts of the XXth International Congress of the History of Art* (1963): 92-104.

³⁵ Jean Bony, "Diagonality and Centrality in Early Rib-Vaulted Architecture," *Gesta* 15/1(1976): 15-25; Grant, *Architecture and Society in Normandy*, 64.

³⁶ Eric G. Carlson, "A Note on Four-Story Elevations," *Gesta* 25/1 (1986): 61-68.

elevation, the presence of wall passages, the sexpartite rib vaulting, and the lantern tower and I will evaluate the role of Norman and Scheldt buildings as sources. The final portion of this chapter will focus specifically on the impact of the crossing tower on Laon by explaining how it functioned and the effects of incorporating a Norman-inspired tower in a Gothic structure.

Political History & Architectural Exchange between Normandy and France

The political history of Normandy and France reveals a tension-filled relationship. The strain was most evident during the twelfth and early thirteenth centuries. Yet the twelfth-century political struggles between Capetian France and the English-governed Normandy provided a constant exchange of artistic and architectural ideas. Although it was officially a part of France, Normandy functioned as an autonomous state governed by a duke, who after the Norman Conquest doubled as the king of England until 1204 when France succeeded in conquering Normandy.³⁷ Within Normandy, there was some discord between the English administration and the Norman people.

While the Normans considered themselves as a separate people from the Capetian French, they aligned themselves culturally with the French more than with Norman England.³⁸ Throughout the 1204 conflict, the Norman church sided with France due to disagreements between Bishop Walter of Coutances and the English king, Richard I, over the rights of the church in the 1190s.³⁹ The rising stress between Normandy and France came to its apex in 1188

³⁷ Grant, *Architecture and Society*, 7. In 1204, Normandy was conquered by King Philip Auguste of France who expelled King John of England from the fortified castle at Chateau Gaillard after an embarrassing six-month siege. Following the death of Henry I in 1135, there was a struggle over the succession of the English throne. The final results of which caused a brief reprieve of English control over Normandy from 1144 until 1154 when Margaret of Anjou conquered Normandy. Administrative ties remained strong with England throughout the period of Anjou control. Finally Henry II regained control of Normandy in 1154, but the extended separation fostered a growing split between England and Normandy. For a full history of twelfth-century English succession see Grant, *Architecture and Society*, 1, 7-8.

³⁸ Ibid., 17.

³⁹ Ibid., 27. The bishops of Normandy asked Pope Innocent III if they should support the English King John or the French King Philip in the 1204 dispute. Pope Innocent III declared that the Norman bishops would have to decide

when King Philip cut down an elm tree that acted as a symbol of amnesty between the regions and which had been the traditional meeting place for peace negotiations throughout the twelfth century.⁴⁰ The felling of the elm tree and thus the destruction of the symbol of peace between the two regions was seen as a sign that Philip intended to claim Normandy as his own.⁴¹ This incident is important because it shows the extent of French-Norman contact during the period of construction at Laon Cathedral. French patrons of Gothic buildings were aware of the enmity between Normandy and France, making it likely that they were also cognizant of Norman architecture. Abbot Suger summarized the French attitude regarding Normandy's independence succinctly saying that Normandy was a part of France.⁴² The effects of the prolonged exchange between France and Normandy are visible in the many Norman-inspired elements of Early Gothic cathedrals.

Early Gothic architecture was strongly impacted by Norman Romanesque buildings.

Many sources of inspiration for Early Gothic structures were eleventh-century Norman monastic

for themselves because he was not familiar with the particulars. The pope's decision is likely a result of his alliance with King John at the time. The Norman bishops likely sided with the French because of the disputes with the various English kings and because of the close history between Saint Denis and Normandy. For a history of the role of the Norman church in the 1204 dispute see; Grant, *Architecture and Society*, 20-28. For a discussion of the connections between Abbot Suger, Saint Denis, and Normandy see Lindy Grant, "Suger and the Anglo-Norman World," in *Anglo Norman Studies: XIX, Proceedings of the Battle Conference 1996*, edited by Christopher Harper-Bill et al, 51-68 (Woodbridge: The Boydell Press, 1996).

⁴⁰ Lindsay Diggelmann, "Hewing the Ancient Elm: Anger, Arboricide, and Medieval Kingship," *Journal of Medieval and Early Modern Studies* 40/2 (Spring 2010): 249-250. In 1188, Philip and Henry II, Duke of Normandy and King of England met near Gisors at an elm tree to discuss the homage due to Philip. Henry II was the first king of England to admit submission and to pay homage to a French king, setting a dangerous precedent and nearly insuring the end of English control over Normandy in 1204. The events are documented in several medieval accounts including William the Breton's *Philippide* and the memoirs of William Marshal. Henry's group had arrived at the elm before Philip and had made camp under the shade of the tree. William Marshal explains that after three days of failed negotiations, Philip ordered his men to cut down the elm tree in a fit which has led him to be labeled as barbarian-like in history. The perception that Henry II intended to conquer Normandy was correct, and soon the French had pushed the Franco-Norman border further west along the Epte river. For a history of the relationship between Henry II and Philip see Grant, *Architecture and Society*, 7-9. For a detailed account of the 1188 incident at Gisors see Diggelmann, "Hewing the Ancient Elm," 249-251. For the account by William Marshal see: A. J. Holden et al, ed., *History of William Marshal* (London: Anglo-Norman Text Society, 2002), 395-400.

⁴¹ Diggelmann, "Hewing the Ancient Elm," 249.

⁴² Grant, Architecture and Society, 9.

foundations, such as those at Jumièges and Caen.⁴³ The abbey church of Saint-Étienne at Caen was copied frequently throughout twelfth-century Normandy, and construction between ca.1150-1180 was discussed as being *à la mode de Caen*.⁴⁴ Few other structures have had as significant of an impact on architectural design as Saint-Étienne. In addition to influencing the majority of churches throughout Normandy, Saint-Étienne also affected the Gothic style more generally throughout the twelfth and thirteenth centuries as can be seen at Sens Cathedral and Saint Denis (Figs 11, 12).⁴⁵ William the Conqueror's abbey church at Caen elevated the sophistication of the Norman wall articulation with the use of colonnette groups and the complete connectivity between the bays and between the stories (Fig. 13).⁴⁶

Norman builders heavily favored a coherent and divisive articulation which translated easily into Gothic designs and suited it well.⁴⁷ Gothic buildings are characterized by a series of bays which run the length of the cathedral. Each bay is divided by a group of colonnettes which connect the main arcade to the high vaults above. The vertical articulation between each bay leads the visitor's eyes heavenward, while they visually link the different stories and emphasize the height. Horizontally, each bay is connected to the next by a string course that separated each story uniting the building as a whole. Laon also incorporates many distinctly Norman elements including the use of wall passages, the chamfered west façade towers, and the lantern much of which seems to be inspired by Saint-Étienne.

⁴³ Ibid, 52-3.

⁴⁴ Ibid, 63-4.

⁴⁵ Jean Bony, "Diagonality and Centrality in Early Rib-Vaulted Architecture," *Gesta* 15 (1976): 22. The sexpartite rib vaulting of Saint-Étienne would prove to be extremely influential throughout France during the twelfth and thirteenth centuries. I will discuss the role of sexpartite vaults specifically at Laon in the next section. The design exchange with Saint Denis ran in both directions indicating a strong connection between the Saint-Étienne and Saint Denis. When Saint-Étienne reconstructed its choir in the 1180s the new choir featured seven radiating chapels rather than the usually five which is an abnormal feature shared by Saint Denis. Regarding the influence of Saint Denis on Saint-Étienne, see Grant, *Architecture and Society*, 98-105.

⁴⁶ Grant, Architecture and Society, 52-3.

⁴⁷ Ibid.

The Impact of the Romanesque in Laon Cathedral

Several Early Gothic structures feature a four-story elevation which was most likely adopted from Romanesque examples in Normandy.⁴⁸ The four-story elevation in Gothic structures developed in the Northern School, for example at Noyon Cathedral and Laon Cathedral.⁴⁹ It was designed to emphasize the verticality of the new style as well as the openness of the plan. The new height was achieved by the addition of the fourth previously missing storythe tribune- that was revived from the early Norman structures such as Saint-Étienne.

Romanesque buildings from the Scheldt, in particular Tournai Cathedral, could also have acted as a source for Laon's four-story elevation. Eric Carlson acknowledges that the Northern School may have adopted their use of the four-story elevation from Tournai, especially given its relative proximity to the Northern School churches (Fig. 14).⁵⁰ Carlson's dating of Tournai makes it contemporary to the construction of the Northern School churches, in particularly with Laon Cathedral. Although he considers the impact of Tournai, Carlson argues that the more likely source of the four-story elevation in the Northern School is Norman architecture because with the contemporaneous dating of Tournai, the Belgian structure could have used the Early Gothic as a model just as easily as it could have impacted it. The abbey church of Notre Dame at Jumièges prefigured the four-story elevation with its blank wall expanse probably intended for wall paintings.⁵¹ While I agree that it is possible that many of the Northern School cathedral used

⁴⁸ Carlson, "A Note on Four-Story Elevations," 64.

⁴⁹ Ibid, 61. The Northern School is a term applied to Gothic Cathedrals in Northern France, particularly Early Gothic Cathedrals in Picardy such as Laon, Noyon, Soissons, etc.

⁵⁰ Ibid, 63. Carlson claimed that Tournai was possible particularly because it is the closest four-story elevation both geographically and chronologically to the Northern School.

⁵¹ Ibid, 64.

Tournai as a model because there is evidence that Tournai impacted other aspects of the cathedral's design- namely the multiple-spired plan.

Most scholars agree that Laon's multi-spired plan was inspired by Tournai (Fig. 15). The Romanesque style transept and nave feature a number of large towers topped by spires similar to the intended spire plan at Laon. Laon Cathedral is located not too far from Tournai and Paul Frankl dates Tournai around ca. 1130-60 making the design of Tournai just before that of Laon (ca. 1160) thus resolving the dating ambiguity suggested by Carlson. Frankl states that while Laon is probably looking at Tournai for inspiration, the multiple towers it features are much more "friendly" than the "war-like" towers at Tournai. The first towers at Laon were the four on the transept and the lantern, the same composition at Tournai.

Laon was originally supposed to have seven towers each with a large spire surmounting the top: two on the west façade, two on each end of the transept, and one large lantern tower over the crossing (Fig. 16).⁵² Today, the cathedral has five of the intended seven- the second set of towers designed for the eastern side of each transept arm was never completed, however the base of the towers can still be seen today (Fig. 17). The cease in construction could be due to a lack of funds.⁵³ The silhouette of Laon Cathedral would have been clearly visible with a stone spire sitting atop each tower. The largest of these spires was to sit over the crossing, placing even more weight on the most precarious section of the building.⁵⁴ Laon's multi-spire plan would

⁵² Dany Sandron, "Laon: La Cathédrale aux Sept Tours," Uměni 49/3-4 (2001): 203.

⁵³ Robert Bork, *Great Spires: Skyscrapers of the New Jerusalem* (Cologne: Kunsthistorisches Institut der Universität Köln, 2003), 77-8. During the thirteenth century, there was a large shift in power from the aristocratic clergy to the bourgeoisie as trade increased and the economy started to boom suggesting that the clergy may not have had the wealth to continue Laon's elaborate design.

⁵⁴ Ibid, 65.

inspire many other cathedrals to consider adopting a similar design, however ultimately the majority of these later cathedrals would abandon the idea of the multi-spire plan.⁵⁵

The combination of the multi-spire plan and the presence of a stocky crossing tower could indicate that Laon was looking both to Norman Romanesque churches, such as Saint Étienne in Caen, as well as to Tournai for inspiration. Tournai, like Laon, is an example of a much lower and thicker construction than the High Gothic cathedrals which would attempt to adopt the aesthetic. To argue that Tournai is probably the inspiration for both Laon's multi-spire plan as well as its four-story elevation is not to diminish the role Norman architecture had in the design of Laon. The sexpartite vaulting prevalent in Early Gothic buildings and used throughout Laon was probably derived from Norman vaults that, following Grant's argument, may have been transported from England around 1120.⁵⁶

The early twelfth-century churches in Normandy were essential to the development of rib vaulting in France. Rib vaults were often seen as a defining characteristic in Gothic architecture, and thus, its genesis was a crucial step in the development of Gothic architecture.⁵⁷ Rib vaulting was probably invented around 1100 in England, and then may have been transported back to France through Norman architecture.⁵⁸ Jean Bony suggested that rib vaults were first adopted in France at the abbey church at Lessay, ca. 1120, where they were placed over the choir, transept, and the easternmost bay of the nave (Figure 18).⁵⁹ It was common practice with early uses of ribbing to highlight specific areas, such as the choir and crossing as well as to add ribs to

⁵⁵ See pages 29-30 of the thesis.

⁵⁶ Grant, Architecture and Society, 46.

⁵⁷ Often times, rib vaulting is seen as being such a defining characteristic that previous scholars in the 18th and 19th centuries would classify a building mistakenly as Gothic simply because it possessed rib vaulting.

⁵⁸ Grant, Architecture and Society, 64.

⁵⁹ Bony, "Diagonality and Centrality,"18.

previously constructed Norman towers to add support and further fireproof the roof.⁶⁰ The first French usage of the rib has recently been identified as in the nave of Saint-Étienne that Lindy Grant dates to ca.1120, citing the similarity between the sculpted capitals for the new clerestory at Saint-Étienne and Henry I's keep at Falaise.⁶¹ The claim that Saint-Étienne transported the rib vault style is essential because it underscores the importance of the Caen abbey church for the Early Gothic; particularly because it combined the various rib styles to create the sexpartite vault.

Sexpartite vaults are only one example of the Romanesque-like elements within Laon Cathedral. Laon also incorporated thick walls within the crossing tower, a four story elevation throughout the cathedral, and wall passages along the exterior of the clerestory. Although these elements are frequently used in Romanesque structures, they were not common within the Gothic. Wall passages as well as thick walls are characteristic of the Norman Romanesque. Sexpartite vaulting and four story elevations both developed around the turn of the twelfth century and are present in both Saint-Étienne in Caen and Tournai Cathedral suggesting the Laon may have looked to both the Norman and Scheldt traditions for sources.

By ca. 1160 there was the feeling that the bulky walls common in Norman ribbed structures were too old fashioned and there was a significant shift to using thin walls such as those seen at Notre Dame in Paris, begun ca. 1160. Although thick-wall construction was quickly

⁶⁰ Grant, Architecture and Society, 64.

⁶¹ Ibid, 64. Jean Bony claims that the ribs in Saint-Étienne's nave cannot be dated before 1130 connecting the construction of the vaults with a visit by Henry I to Caen in 1128 and a donation of funds for construction of the church in 1128. Carlson also dates the vaults at Saint-Étienne as being between 1128 and 1135 (death of Henry I). Both Bony and Carlson rely on a charter from Henry I which was purchased by the Morgan Library in 1947. The charter states that Symon de Bosville gave a grant of money for the Saint-Étienne. Grant suggests that the donation could have been for the maintenance of the church rather than the vaulting of the nave. For a discussion of the Morgan Library charter on the donation, see Eric Carlson, "A Charter for Saint-Étienne, Caen: A Document and Its Implications," *Gesta* 15 (1976): 11-14. For Bony's argument on the dating of Saint-Étienne's vaults, see Bony, "Diagonality and Centrality," 15-25. For Grant's discussion of the Saint-Étienne vaults, see Grant, *Architecture and Society*, 60-64.

losing its fashionable status, Laon Cathedral is constructed with a thick-wall construction similar to those of the canonical Norman style.⁶² The Aisne valley, where Laon is located, was particularly interested in thicker walls for constructing their cathedrals because they provided the perfect opportunity to have wall passages and easily supported crossing towers.⁶³ Laon's use of thick-wall construction allowed for wall passages, another feature common in Norman architecture. Laon possessed both internal wall passages-namely the triforium-but it also used external wall passages along the transept and crossing tower. The use of wall passages was a common feature of early Norman and Anglo-Norman structures, particularly at Jumièges and Caen and can be most easily seen at Laon within the crossing tower.⁶⁴

The crossing tower at Laon was also probably derived from Norman structures such as Saint-Étienne in Caen and Notre Dame at Jumièges (Figs. 5, 10, 21). There are no scholars who have suggested that Laon's tower is based on Saint-Étienne's. However, Eric Carlson suggested that the wall passage on the interior of the lantern tower at Laon borrowed its design from Saint-Étienne's triforium passage in the nave and Alain Saint-Denis has posited that Laon's crossing tower was based on Norman towers.⁶⁵

By comparing the interiors of the two towers at Saint-Etienne at Caen and Laon, the similarities between the ribbing, the window treatments, and the arcades are evident. Both towers feature star-shaped ribs which radiate from a central circular boss of stone. Both towers are square and have three levels: a blind diaphragm arch creating the base of the tower, an arcade, and fenestration. The most overt difference between the towers is the use of a wall passage in the

⁶² Carlson, "A Note on Four Story Elevations," 62.

⁶³ Grant, Architecture and Society, 48.

⁶⁴ Ibid, 53.

⁶⁵ Carlson, "A Note on Four Story Elevations," 62; Saint-Denis, et al., *Laon: La Cathédrale*, 62. Saint-Denis does not hypothesize which Norman structure Laon seems to use as a source for the crossing tower, but he does suggest that the masons of Laon Cathedral were looking at Norman structures based on similarities within their structure, decoration, and design.

crossing tower at Laon whereas Saint-Étienne contains only a blind arcade. The wall passage in the crossing tower at Laon makes the wall structure similar to the thick-wall structure common in Norman buildings.

Laon's thick walls are most noticeable in the crossing tower, particularly when compared with the lantern tower at Saint-Etienne. The upper portion of the Laon crossing tower wall is thin and flush with the windows. In contrast, the walls in the tower at Saint-Étienne are thick from the base of the tower to the vaulting. This can be seen in the windows that are set back in the wall thickness as opposed to Laon. The difference in wall thickness at the top of the crossing tower, suggests that Laon's thick walls may have been inspired by Notre Dame at Jumièges, another Norman abbey. Laon's gradual wall thinning was similar to the wall structure at Jumièges, the difference being that Laon's walls thin from the exterior creating a telescope effect, while Jumièges thins on the interior of the building (Figs. 4, 5, 21).

The use of the crossing tower was a dominant feature in Norman architecture, and in Romanesque architecture as a whole. Romanesque builders liked to incorporate crossing towers into their church designs because they functioned well in the liturgy, and because they showed off the engineering talents of the region.⁶⁶ Crossing towers also had a symbolic function as they represented the holy city both from a distance as a visual landmark representing the city and within the church itself, emphasizing the liturgical choir. As important as crossing towers were symbolically for both the city and for the liturgy, they were dangerous to build and difficult to construct securely.

⁶⁶ Grant, Architecture and Society, 53.

CHAPTER 3

CROSSING TOWERS & THEIR STRUCTURAL LIMITATIONS

Towers have been used as political and religious symbols of power, as military fortifications, and as architectural landmarks. In the middle ages, they acted as landmarks, as guiding compasses, and as declarations of the power of Christianity. Towers drew the eyes of viewers heavenward while affirming the power of the aristocracy and the local church. Often a church would feature at least two towers, one on each side of the façade. Crossing towers developed as a means of drawing attention to the crossing where they could bring vertical emphasis and connect the church interior with the heavens.

A folio in a manuscript depicting the Carolingian Abbey of St. Riquier preserves a representation of one of the earliest examples of a crossing tower (Fig. 22). The drawing of St. Riquier shows a church with large, telescoping towers above each end, and suggests that the tradition of placing a central tower developed in the late eighth century under the Carolingian Empire. Under the Carolingians, crossing towers were developed as a means to emphasize the intersection of the nave, the transept, and the choir and to act as a symbolic representation of both for the church community as well as the city. They continued to be a prominent feature of medieval architecture until the Early Gothic style when the use of crossing towers in French Gothic cathedrals virtually disappeared until the end of the thirteenth century with the emergence of the Late Gothic style. From a distance, a crossing tower visually represented the city as a

landmark which could be seen from miles away.⁶⁷ Laon's multi-tower plan could be interpreted as a visual icon of the city itself because it mimics a city skyline. Furthermore, its location on a plateau would easily distinguish and identify Laon while connecting the city with the church building itself.

Within the cathedral, windows in the central lantern tower focused light upon the liturgical choir, both heightening the drama of the service and connecting it with heaven.⁶⁸ Furthermore, the highlighted crossing acted as a preparatory space for the high altar where the main relic be housed.⁶⁹ Gunter Bandmann and Richard Krautheimer both linked crossing towers with baldachins, stating that the central tower hovered over the core of the church as a sort of spiritual baldachin connecting the building with holy sites such as Saint Peter's and the Holy Sepulcher.⁷⁰ Central towers provided a focus at the center of the church, a light source for the crossing, and they acted as an embodiment of the Heavenly City.⁷¹

Given the symbolic functions of crossing towers within the sacred space and their guiding silhouettes, it is clear why crossing towers were featured so prominently throughout medieval architecture. However, with the rise of the Gothic style, crossing towers were not used as frequently in France. It may be that engineers constructing structures in the Early Gothic style were hesitant to place a central tower over the thin walls characteristic of Gothic cathedrals. As I will explain in this chapter, crossing towers were dangerous to build and often had significant structural concerns. The primary function of this chapter is to describe the problems associated

⁶⁷ Gunter Bandmann, *Early Medieval Architecture as Bearers of Meaning*, trans. Kendall Wallis (New York: Columbia University, 2005), 60-63.

⁶⁸ Ibid, 57.

⁶⁹ Ibid, 180.

⁷⁰ For a discussion of the connection between crossing towers and martyria, mausoleums, the Heavenly City, and the Holy Sepulcher see Bandmann, *Early Medieval Architecture*, 87-89; 161-186. For a further discussion of the Heavenly City, see Richard Krautheimer, Early Christian and Byzantine Architecture (Kingsport, TN: Kingsport Press, Inc., 1986), 299.

⁷¹ Lindy Grant, Architecture and Society in Normandy: 1120-1270 (New Haven: Yale University Press, 2005), 57.

commonly with crossing towers and offer an explanation as to why architects of Gothic cathedrals chose to reject the crossing tower tradition.

Structural Concerns within Lantern Towers

Towers are tall structures. This may seem like an obvious statement, but the inherent height is essential to understanding both the power being their symbolic meaning as well as the potential hazards in their structure. It was the height that both caused the majority of the structural problems which plague towers and made the grandest statement.⁷² Towers underscored and augmented the French Gothic emphasis on verticality. Builders actively sought a feeling of openness, light, and height when they designed Gothic churches. In order to create such a divinely inspired atmosphere, the master masons used vertical wall articulation and large expanses of windows. A crucial element in achieving the desired open floor plan was the use of thin walls rather than the thick-wall technique characteristic of Romanesque buildings. Norman Romanesque buildings were especially known for their use of thick-walls as well as their incorporation of crossing towers. The shift to the thin walls prevalent in the French Gothic caused the previous structural stability of crossing towers to wane.

Likewise, the height of towers caused the wind loads to be a major concern for medieval architects. The most damaging factor regarding towers was wind forces. As a tower ascended, the wind forces exacerbated and put increasing pressure upon the tower proportionally (Fig. 23).⁷³ The increase in wind pressure weakens the compressive strength of the stones and causes structural fractures in the upper portions of the building that could impact the stability of the piers below.

⁷² Robert Mark, *Experiments in Gothic Structures* (Cambridge: MIT Press, 1982), 19. Although the weight of the stones themselves might seem to be a major concern for medieval engineers, the dead weight of the masonry was fully supported by the compound piers below regardless of the tower's height.
⁷³ Ibid.

²⁶

Shifts in the foundation soil or in the masonry blocks of the walls and pillars were also a major concern when building a tower. In the event of substantial shifting, the structural stability was severely compromised, often leading to the collapse of the tower or damage to the bays surrounding the crossing. In either a case of the mortar failing or when the soil supporting the foundations of a cathedral slips, the same effect occurs: the delicately balanced skeleton which relies so heavily on pin-pointed gravity would be skewed.⁷⁴ Following this the stones would slide out of place furthering the loss of equilibrium and causing more shifting until ultimately a portion of the building would fall.

This was thought to be a major problem at Chartres Cathedral when in 1316 experts from Paris were brought in to examine the cathedral's structural stability and to give their opinion on the construction of a belfry.⁷⁵ It was presumed that the mortar in the flying buttresses had shifted, endangering the structural integrity of the high vaults. If the slippage continued, then the buttresses would not adequately support the high vaults, causing their collapse which would result in significant damage. The experts brought to Chartres in 1316 suggested refilling the joints with new mortar to try to avoid the problems and prevent any further damage.⁷⁶ At the same time, the transept was examined and the crossing vault was deemed perilous and was then replaced at the suggestion of the Parisian engineers.⁷⁷ The concerns in the fourteenth century regarding the crossing were probably similar to those felt during the late twelfth and early thirteenth century at Laon.

Medieval mortar was an unpredictable medium which could prevent disaster as easily as it could cause it. Most pre-modern mortars were made from lime or were a mixture of lime and

⁷⁴ Mark, *Experiments in Gothic*, 82.

⁷⁵ Victor Mortet, "L'expertise de la cathédrale de Chartres en 1316," *Congrès. Archaeologique de Chartres* 67 (1900): 314.

⁷⁶ Ibid, 315.

⁷⁷ Ibid, 318.

sand.⁷⁸ These mortars could take anywhere from decades to centuries to completely dry and be structurally stable. In most cathedrals, this was not a problem because the brunt of the forces were balanced using the dead weight of the blocks, the thrusts, and gravity giving the mortar plenty of time to settle and fully set. But when the soil beneath the foundations shifted causing the stones above to slide, the previously balanced thrusts were forced onto other piers or arches which were not readily equipped to handle the new directional thrust or the extra weight.

When examining the specific structure at Notre Dame de Laon, actual engineering problems do not seem to be a factor. The lantern tower placed over the crossing was relatively low in comparison to later Gothic spires, making it unlikely that there were excessive wind forces or bending stress.⁷⁹ The cathedral at Laon does not appear to exhibit any evidence of shifting stones either caused by poor soil quality supporting the foundations or by faulty mortar.⁸⁰ However, while there do not seem to be any legitimate problems with the actual building at Laon, the canons originally planned a much heavier crossing tower.⁸¹ Several other cathedrals, including Chartres and Reims, planned to incorporate elaborate spire plans, modeled after the ambitious multi-spire plan designed for Laon (Fig. 24). These same cathedrals too would later abandon them and construct their churches with only the harmonic façade or a small, modest spire over the crossing. Crossing towers themselves were not incorporated into Gothic

⁷⁹ Bork, *Great Spires*, 95. In later Gothic building, several elaborate crossing towers and spires fell because they were ambitiously tall. For example, when the enormous spire was placed over the crossing at Beauvais the structure was compromised and the spire collapsed shortly after its completion. For more information regarding the history at Beauvais and the various collapses see Jacques Heyman, "Beauvais Cathedral," in *The Engineering of Medieval Cathedrals*, edited by Lynn T. Courtenay, 169-190 (Aldershot, Hampshire: Ashgate Publishing, Ltd., 1997).
⁸⁰ None of the scholars who have studied Laon discuss any structural problems within the cathedral; however, there

⁷⁸ Robert Mark, *Light, Wind, and Structure* (Cambridge, MA: MIT Press, 1990), 26.

has not been a recent assessment of the building's structure. Laon cathedral is built on a large bed of limestone, from which the stone was quarried for many parts of the cathedral, suggesting that soil shifting would not have been a problem. There are no problematic cracks visible or obvious structural problems. Clark, *Laon Cathedral*, vol. 1, 4. See chapter one for a discussion of the site history.

⁸¹ Bork, *Great Spires*, 95. For a review of the restorations and other changes made to the cathedral's plan and structure, see chapter one.
structures again until the late thirteenth century. The rejecting of the multi-spire plan suggests that there must have been a prevalent concern in the early thirteenth century about placing a crossing tower over a Gothic structure. Today only Lichfield cathedral in England was completed according to plan and survives as an example of a multi-spire building (Fig. 25).⁸² While several scholars argued that spire plans were forgone due to the change in taste or a lack of funds, given the situation at Laon it seems likely that another cause was an acute concern regarding placing so much weight on towers, in particular over crossing towers.⁸³ If the tower was too heavy over the crossing, the already precarious structure of the lantern would be augmented, and the tower could collapse or damage the surrounding bays of the cathedral.

Tower collapses were common throughout the middle ages, even before the advent of the Gothic period. Several crossing towers in England collapsed in the decades before the chevet at Laon was transformed, suggesting that the English churches provided a model for disaster, allowing Laon to anticipate and the collapse of a crossing tower. The crossing tower over the Romanesque church in Winchester collapsed in 1107 causing serious damage to the transept and transept chapels.⁸⁴ Likewise, the collapses in the towers at Lincoln and Beverly Minster, both of which occurred shortly before or in the decades following the change in chevet design at Laon, furthers the evidence that crossing towers collapses were a real concern in the late twelfth and early thirteenth centuries.

⁸² Bork, Great Spires, 95.

⁸³Janzten argued that the change in design away from spires was due to a shift in taste among the clergy. He argued that the clergy wanted to focus more attention on the west façade and began to construct elaborate portal sculpture and rose windows. For Janzten's discussion of the shift away from spires and the development of the west façade see Jantzen, *High Gothic*, 98-112. Robert Bork suggested that the shift away from spires was due to the changing power in the thirteenth century and that spires, a sign of cleric power and a non-functioning money vacuum, were not worth the time, funds, and danger associated with building them.

⁸⁴ John Crook and Yoshio Kusaba, "The Transepts of Winchester Cathedral: Archaeological Evidence, Problems in Design, and Sequence of Construction," *Journal of the Society of Architectural Historians* 50/3 (Sept. 1991): 298.

The structural problems which were common in crossing towers could be lessened by choosing an octagonal design rather than the square shape which dominated the Norman tradition. Octagonal crossing towers were prevalent in the Burgundian Romanesque and are often associated with Cluny. They distributed the weight of the tower and the lateral thrusts more evenly along the entire base of the tower rather than focusing all of the tower's weight on the four corner piers of the crossing.⁸⁵ Saint-Étienne in Caen's tower has a large octagonal outer shell surmounting the square which in combination with the thick walls probably never presented the same structural concerns as the Laon tower (Fig. 26).⁸⁶ Following the precedent set by Saint-Étienne, octagonal crossing towers became popular in Normandy during the early twelfth century as demonstrated by the construction of an enormous octagonal lantern at Coutances and the impressive wooden octagon built at Ely in the fourteenth century.⁸⁷ The use of the octagonal shape for the Coutances lantern may have reflected a concern regarding Gothic crossing towers, especially because Coutances also features much thicker walls than the average thirteenthcentury building and utilizes wall passages minimalizing the risk associated with Gothic crossing towers.⁸⁸

⁸⁵ Jacques Heyman discusses octagonal spires and towers as being more capable of supporting weight because they can more evenly distribute the weight through the supporting piers. See Jacques Heyman, *The Stone Skeleton* (Cambridge: Cambridge University Press, 1995), 133-34. Furthermore, Robert Mark discusses domes as being more capable than towers of resisting both the lateral thrusts of the vaults and the wind forces when he discusses the structure of Christopher Wren's design for St. Paul's. See Mark, *Light, Wind, and Structure*, 156.

⁸⁶ The octagonal superstructure, at Saint-Étienne's, added in the seventeenth century after the tower collapsed, parallels the later plans to place stone spires atop the multiple towers at Laon the largest of which was to sit over the crossing increasing the structural risk. The octagon at Caen cannot be seen from the interior of the church which allows for the structure to use any means to support itself since the support structure is not visible. For a complete discussion of multi-spire plans, see Bork, *Great Spires*, 65. For a discussion of the addition of the octagonal superstructure of Saint-Etienne's, see Carlson, "The Abbey Church of Sainte-Etienne at Caen in the Eleventh and Early Twelfth Centuries" (PhD diss., Yale University, 1968), 212.

⁸⁷ Grant, Architectural and Society, 168.

⁸⁸ Ibid, 171. Coutances has wall passages in its lantern tower as well as in the side aisles. This is probably a regional aesthetic choice. Throughout the later parts of the twelfth and early thirteenth centuries, Norman Gothic buildings harkened back to eleventh century designs. For a complete explanation of the role of eleventh- century architecture on Norman Gothic see Grant, *Architecture and Society*, 80-85.

Given the danger associated with building crossing towers and the inevitable structural concerns which were present even in buildings which feature thick walls and supports, it is clear that the combination of thin walls (typical in French Gothic building) and a central tower were a concern for Gothic engineers. The Early Gothic style is in many ways a building tradition which was largely experimental. Laon may have experimented with its adoption of the multi-spire plan using the Gothic style and then had later doubts about the structural stability of the design. It could be in response to these structural concerns that the Laon canons stopped the construction of the crossing tower half-way through and changed the design of the chevet before finishing the central tower. The rectangular design of the new chevet is reminiscent of English Gothic designs which were frequently paired with crossing towers. It seems plausible that the Laon canons modeled their newly constructed square chevet after an English model in hopes of preventing the collapse of its central tower.⁸⁹

⁸⁹ See chapter four.

CHAPTER 4

THE CHOICE OF THE SQUARE CHEVET

This chapter investigates the changes in the chevet plan at Notre Dame at Laon: why did the canons change the chevet and why choose such a distinctly English design (Figs. 1, 3, 4, 6). Eric Fernie and Alain Saint-Denis suggested that the canons needed additional space in the choir for liturgical purposes.⁹⁰ However, while the idea that the choir needed to be expanded indeed justifies the extension, it does not explain why the construction of the crossing tower was halted or why the chevet was rebuilt with a square apse. The pause in the tower construction implies that the canons of Laon were concerned about a structural problem with the crossing tower and deliberately chose an English design—that of the square apse—to buttress the crossing as a precaution. It is not my intention to prove that there was an actual problem with the structure at Laon: there is no evidence that such a problem ever existed and the extent of engineering knowledge in the medieval era is still debated. I will instead discuss the suspicious role of the tower and compare it with other contemporary buildings which have the same structural issues arguing that the canons were anxious about the crossing tower and adapted the chevet in response.

In this chapter, I will first argue that the Laon canons chose to construct a square end with a flat terminal wall because of the concern for the stability of the crossing tower while giving the needed additional space for the liturgy. Following an English model where crossing towers were

⁹⁰ Both Eric Fernie and Alain Saint-Denis suggest that the choir was originally extended in order to give the liturgy more space. Fernie argues that the two most eastern bays of the nave were likely added later to give more liturgical space to the crossing because the liturgy frequently spilled into the nave of Laon. This suggests that the Laon canons were in need of more space in the choir and in the crossing. For more information, see chapter one.

frequently paired with rectangular chevets, the canons may have thought that a flat terminal wall could more easily support the Norman tower in Laon than the traditional rounded apse. The same type of transformation occurred in Wales at the small Cistercian church, Abbey Dore in Herefordshire, where the builders attempted to buttress their crossing tower with renovations. Then, I will examine the extension of the chevet from its original three bays to ten bays which parallels the design of the nave. Finally, I will explain the aesthetic and structural effects caused by the square chevet at Laon.

An English Solution

It is not surprising that Laon would look to England for solutions to assuage the concerns regarding the crossing given the frequency of the combination of the rectangular apse with a crossing tower. The English medieval builders embraced the tradition of a square apse in the Anglo-Saxon period.⁹¹ The fully fleshed rectangular chevet developed from the idea of the annular crypt which in England frequently existed above ground as an extension to the apse rather than beneath the chevet as in its French counterpart.⁹²

After the invasion by William the Conqueror in 1066, Norman architecture became widespread in England. The Norman building tradition often placed crossing towers at the center of buildings and incorporated thick-walls to support them without any structural issues, unlike the later English and French Gothic structures. Although the later English Gothic cathedrals would not aspire to the great heights or have quite the same slender wall construction as the

⁹¹ M.F. Hearn, "The Rectangular Ambulatory in English Mediaeval Architecture," *Journal of the Society of Architectural Historians* 30/3 (October 1971):203.

⁹² Ibid, 202.

French, they also had overly ambitious crossing towers surmounting walls that could not support them, as later and frequent collapses would prove.⁹³

Although the documented history of English towers collapsing suggests that England would not be an ideal source of solution for Laon's structural concerns, the majority of these collapses took place in later centuries. Frequently the collapses of the English crossing towers was the result of the addition of a spire to the top of the crossing tower or due to a storm. Since the majority of the documented collapses occurred after Laon's chevet reconstruction, an England would have been seen as a viable option by the canons. Furthermore, it is not surprising that Laon used English architecture as a model because Laon had extensive contact with England throughout the eleventh and twelfth centuries.

Hélinand was bishop of Laon from 1052-1098.⁹⁴ Although he was of humble French origins, Hélinand was made the envoy to Henry I of France by Edward the Confessor.⁹⁵ Henry I later promised Hélinand that upon the death of a bishop he would be afforded that bishop's seat, which he fulfilled by declaring Hélinand the bishop at Laon in 1052. The English connection with Laon is furthered by the 1113 relic tour through southern England and Wales.⁹⁶ These eleventh and twelfth century exchanges between England and Laon, as well as the Norman

⁹³English Gothic cathedrals have suffered a number of tower collapses over the years including Durham in the fourteenth century which was due to a storm, Worcester, and Beverly Minster in 1200. There were also a number of scares which provoked panicked buttressing and propping. These include Salisbury and Wells to name a few.
⁹⁴ John Benton, ed., *Self and Society in Medieval France: The Memoirs of Abbot Guibert of Nogent* (New York:

Harper & Row, 1970), 126.

⁹⁵ Ibid, 146. Hélinand captured the attention of the English King through his contact with Gautier of Pontoise and was given the role of envoy to the French monarchy based on his mastery of court customs.

⁹⁶ J.S.P. Tatlock, "The English Journey of the Laon Canons," *Speculum* 8 (1933): 455. In 1112 and 1113 the Laon canons journeyed through Flanders, southern England, and Wales to raise funds to rebuild Laon Cathedral after it suffered tremendous damage during the Commune Revolt of 1112. For a complete discussion of the Commune Revolt, the English journey taken by the Laon canons, and their effects on Laon Cathedral, see chapter one. For additional sources regarding the Commune Revolt of 1112 see Saint-Denis, *Apogée d'une Cité: Laon et le Laonnois aux XIIe et XIIIe Siècles* (Nancy : Presses Universitaires de Nancy, 1994).

Romanesque elements within the cathedral, make it plausible that Laon had a strong link with England and may have known their building traditions well.⁹⁷

Given the long history between England and Laon throughout the centuries preceding the construction of the Laon Cathedral and the frequent pairing of a crossing tower and an extended rectangular chevet in English cathedrals, it is not surprising that Laon would seek a solution in England. To the canons at Laon, the distinctly English combination of a rectangular apse seemed like it would work well as a buttress for the crossing tower. Moreover, there is an English precedent: a twelfth-century abbey church that shared Laon's concerns regarding the combination of a crossing tower and a Gothic building. Shortly before the transformation of Laon's chevet, an English church, the Abbey Dore, suffered similar problems with its crossing tower and solved their problem by expanding the square chevet and bolstering the crossing piers.

The Crossing Tower and Square Chevet at Abbey Dore

The structural changes which occurred at the small Cistercian abbey church, Abbey Dore, during the twelfth century indicate that the Abbey Dore monks had concerns regarding the stability of their crossing tower. Abbey Dore, in Herefordshire, was founded in 1147 by Cistercian monks from Morimond just before Laon's construction began.⁹⁸ Unlike Laon, Abbey Dore originally followed a 'Bernadine' plan and featured a rectangular chevet from the start with two small oriented chapels on either side of the choir as well as a crossing tower (Fig. 29).⁹⁹ Although the crossing tower has since been dismantled, the large piers in the crossing and the frequent placing of crossing towers at other Cistercian churches in the mid-twelfth century

⁹⁷ Normandy was under the control of the English dynasty until 1204 when control over the region was taken by France. See chapter two.

⁹⁸ Carolyn Malone, "Abbey Dore: English versus French Design," In *Studies in Cistercian Art and Architecture*, edited by Meredith Parsons Lillich, Vol. 2, 50-75 (Kalamazoo: Cistercian Publications Inc., 1984), 50.

⁹⁹ David Robinson, *The Cistercians in Wales: Architecture and Archaeology 1130-1540* (London: The Society of Antiquaries of London, 2006), 63-64. For a more detailed description and explanation of the Bernadine plan, see his chapter 5.

suggest that there was a crossing tower.¹⁰⁰ Although most of the small church was constructed in a much bulkier style, the transept is Early Gothic, as seen by large pointed arches, wall articulation, and large pointed windows (Fig. 30). This would make the Abbey Dore one of the first examples of the Gothic style in England and were likely experimenting with the Gothic design as in Laon. The Cistercians have been heralded by scholars as the transmitters of the Gothic style and some have argued that the presence of a Gothic transept in Abbey Dore is evidence that the Cistercians were responsible for bringing Gothic architecture to England.¹⁰¹ It is no surprise that the transept in the Abbey Dore was one of the first instances of Gothic in the British Isles and was certainly one of the earliest examples of Cistercian architecture in Wales.¹⁰² Since it was an early example of Gothic architecture in France, it is plausible that the architect of the Abbey Dore was not aware of the structural hazards Gothic crossing towers presented.

The Abbey Dore monks' concerns regarding the crossing tower can be seen in the transformation of the crossing tower piers. They were enlarged at the bases, likely due to a concern that a Gothic transept would not be sufficient support for a crossing tower because of the thinness of the walls.¹⁰³ A one-foot protrusion in width was added to the east side of bases of the west crossing tower piers. On the west side the protrusions are three feet. The crossing piers

¹⁰⁰ Crossing towers were frequently placed in Cistercian abbeys in the south of England in the 1160s and 1170s. For example, crossing towers were placed at Kirkstall, Fountains, and Buildwas. Malone, "Abbey Dore", 60. David Robinson suggested that the Abbey Dore was largely modeled after Buildwas so it isn't surprising that Abbey Dore also adopted a crossing tower. Robinson, *Cistercians in Wales*, 59.

¹⁰¹ Several scholars have strongly argued that the Gothic style was brought to England and spread across Europe by the Cistercian monasteries indicating the Abbey Dore is one of the earliest examples of Gothic architecture. The most prolific of these scholars, Christopher Wilson, discusses the spreading of the Gothic style by the Cistercians in his publications, "The Cistercians as 'missionaries of Gothic' in northern England," and *The Gothic Cathedral*, (London: Thames and Hudson, 1990), 73.

¹⁰² Malone, "Abbey Dore," 51. A connection between Cistercian Wales and France has been argued by both Carolyn Malone, Jean Bony, and Peter Fergusson whom cite the transept at Eure and the church of Val d'Oise as being sources of influence on Abbey Dore. A connection between France and Cistercian Wales would further support the idea that Laon may have been inspired by the Abbey Dore for their square chevet design. For more information regarding the French sources see: Malone, "Abbey Dore," 52; Fergusson, *An Architecture of Solitude*, 99; Bony, "French Influences on the Origins of English Gothic Architecture," *Journal of the Warburg and Courtauld Institutes* 12 (1949): 11.

¹⁰³ Malone, "Abbey Dore," 59.

acted as an anchor and a buttress for the tower above them and were further supported by reinforcing the crossing pillars. These thicker supports could have been recalling the eleventh and twelfth-century Norman tradition where thicker walls and crossing towers were common and structural problems in the crossing were, therefore, less of a concern. The larger size of the three-foot western protrusions as compared to the one-foot eastern extensions was explained by Carolyn Malone as a means to give further support to the nave side of the crossing.¹⁰⁴ Malone argued that the nave needed more assistance in supporting the tower because the square chevet in Abbey Dore buttressed the eastern side.

However, the monks may have thought that the tower needed even further support because they extended the choir in 1186 and thickened the eastern terminal wall considerably with the addition of an ambulatory passage (Fig. 31).¹⁰⁵ The extension of the choir at Abbey Dore created a more substantial eastern arm and thus a stronger prop for the crossing tower.¹⁰⁶ Although unlikely, it is not impossible that Laon's redesigned chevet used the remodeled chevet at the Abbey Dore as a model. The histories of the two sites are similar and the Abbey Dore's apse was reconstructed only a decade or two before the transformation of Laon's chevet.

While the rectangular design of Laon's chevet suggests that the canons chose to model the new apse after English precedents in hopes of buttressing the crossing tower, it is probable that the initial extension was due to a pressing need for more choir space. With only three bays in the original design of the chevet, the liturgical space within Laon would have been limited. The need for more space in the choir is further supported by the fact that Laon was a successful growing metropolis throughout the end of the twelfth and early thirteenth centuries.

¹⁰⁴ Malone, "Abbey Dore," 61.

¹⁰⁵ Robinson, *Cistercians in Wales*, 118-19.

¹⁰⁶ In 1186, Adam I became the abbot of Dore and decided to elaborately expand the eastern arm of the Abbey Dore. The decision to renovate the barely completed Dore might reflect the design of the church's mother house at Morimond which was an impressive site in itself.

Extending the Chevet

Although the architectural space known as the choir was defined as being placed to the east of the crossing, the space where the liturgy was performed frequently spilled across the crossing sometimes extending a bay or two into the nave.¹⁰⁷ Processions were important within medieval liturgical practices, and often the clergy or lay people would circulate through interior of the cathedral and pass under the crossing. This was probably the case at Laon Cathedral. Eric Fernie argues that the nave was extended by two bays in the twelfth century in order to accommodate a need for more space in the nave and crossing for the liturgy to be held.¹⁰⁸ This is evidenced by the change in column design within the arcade in the two most eastern bays (Fig. 28). Fernie's argument suggests that at Laon, the liturgical choir space was primarily located in the crossing and was thus situated directly below the lantern tower. The use of a tower over the crossing to mark the importance of the crossing is not new for Early Gothic structures, but has also been documented in use within Norman Romanesque churches.

Crossing towers were first used as a way of focusing attention on a specific portion of the church.¹⁰⁹ In Norman religious services, crossing towers focused the attention on the liturgical choir.¹¹⁰ Lantern towers were particularly useful because they allowed streams of light to shine onto the liturgical choir providing light for the service as well as an inspiring atmosphere in which to pray. Furthermore, the light shining down would be focused just before the most

¹⁰⁷ Eric Fernie, "La Fonction Liturgique des Piliers Cantonnés dans la Nef de la Cathédrale de Laon," *Bulletin Monumental* 145 (1987): 265.

¹⁰⁸ There are a number of scholars who argue that the eastern arm of Laon was extending in order to accommodate a need for more liturgical space. Ca. 1205, the original choir of three bays was furthered to an astounding ten bays in length. For an explanation of this theory see Lindy Grant, *Architecture and Society in Normandy: 1120-1270* (New Haven: Yale University Press, 2005), 224; Fernie, "La Fonction Liturgique," 265-66. Throughout the 12th and 13th centuries, the eastern arms of Norman French and Norman English buildings were expanded in order to accommodate monastic growth. For a discussion of this trend in general, see Grant, *Architecture and Society*, 47; 224.

¹⁰⁹ Gunter Bandmann, *Early Medieval Architecture as Bearers of Meaning*, trans. Kendall Wallis (New York: Columbia University Press, 2005), 154.

¹¹⁰ Grant, Architecture and Society, 224.

important part of the cathedral—the high altar—bringing the attention of the visitor to the service.

While the crossing tower at Laon was useful in bringing emphasis to the choir as well as providing light for the canons during the liturgy, it may have caused concerns among the Laon canons regarding the structural stability as I have already discussed. The extension of the choir served as a means to give the canons more space for the liturgy while the square shape of the design is a reflection of the canons' reservations regarding the structure of the cathedral. Although the additional liturgical space was a necessity and probably in part caused the change in chevet design, it was not the only effect triggered by the reconstruction of the chevet.

Aesthetic and Functional Effects Following the Change

The reconstruction of the chevet at Laon caused the building's overall appearance, feel, and layout to shift drastically. With the new design, Laon's floor plan changed by extending the choir from its former three bays to ten and terminated the space with a flat wall (Fig.2, 3, 6). The new chevet exactly mirrored the nave which was also ten bays as well as provided the space for a fourth rose window. The premise of the second volume of Clark's monograph on Laon was about this very effect of unity found in Laon.¹¹¹ Clark posited that the chevet was altered in order to achieve the unity fostered by the new chevet and was meant to focus on the crossing and the tower above it.¹¹²

¹¹¹ William Clark, *Laon Cathedral: Architecture*, Vol. 2 (London: Harvey Miller Publisher, 1987), 10.

¹¹² Ibid. For a complete discussion of William Clark's theory on the chevet change, please see chapter one. The rectangular shape of the new chevet could also be connected to relics since the change made Laon's relics more accessible for veneration. Rectangular apses were sometimes adopted in Italy in order to house relics and allow for a more organized passage for pilgrims. However, in the specific case of Laon, there is no evidence that the rectangular choice was related to the relics and the relics are not housed there today. For more information regarding the connection between the rectangular shape of the chevet and relic veneration, see Charles Freeman, Holy Bones, Holy Dust: How Relics Shaped the History of Medieval Europe (New Haven: Yale University Press, 2011): 100-107.

It is improbable that the canons at Laon chose to rebuild the chevet entirely based on aesthetics. The continuous visage of the identical moldings in the choir and in the nave would have been interrupted by the choir screen. A typical thirteenth-century screen acted as a wall of sculpted stone completely blocking the view of the choir (Figs.6, 31). However, in terms of the decorative and architectural design, the final effect within the cathedral is one of complete harmony and cohesion. Looking down the length of cathedral, there is no interruption in the rhythm of the bays. The identical length of the chevet and the nave create a balance which is furthered by the similar design of the glazing and architectural decoration. Both the chevet and the nave feature alternating groups of colonnettes; a cluster of three colonnettes between a group of five, each of which are connected by small horizontal bands ascending up to the main vaults (Figs. 4, 6, 7). Both wings of the building use an abstracted Corinthian style capital and feature identical elevations. String courses separate the stories and visually connect the cathedral from west to east.

Similarly, the modified glazing in the choir terminal mirrors the stained glass in the west façade. While the scenes depicted within the windows differ, the construction of the tracery in the roses is identical and the composition of the lancets is similar (Figs.33, 34). Both roses center around a large scalloped hub and feature a ring of pentagon shield-like panes of glass. Between each pentagon is a large lunette that runs around the edge of the rose and borders the wall. The main difference between the stained glass in the chevet and the west façade is the number and size of the lancets above which each rose window is surmounted. The rose in the west façade hangs above a group of five small lancets which are not visible from the interior of the cathedral and which are partially blocked by the gable of the central portal in the west façade. The glazing

in the chevet is completely visible from the exterior and the interior and encompasses a large portion of the terminal wall.

The large expanses of glass which cover the eastern wall of the choir are as unique for this relatively early period of Gothic architecture as is the rectangular chevet to which it belongs. The chevet terminal has been dated to c. 1210-1215.¹¹³ When comparing this terminal with other contemporary rose window groups, such as the north transept windows at Chartres, it is clear that the overall shape of the windows is similar (Fig. 35). The general ratio of glass to tracery is relatively low and both roses follow the same basic principle of using rings of geometric-shaped panes of glass radiating from a central hub. However, the glazing in the north transept at Chartres only encompasses the top portion of the wall while the windows in the chevet terminal wall at Laon fill the entire surface. The only expansive portions of stone left at Laon are the formeret arch surrounding the entire window group and the spandrels between the rose and the lancets.¹¹⁴ The rose and lancet construction in the chevet terminal wall at Laon virtually create a wall of glass which prefigures the transept terminals and eventually the west facades which would feature more glass than stone, such as the north transept terminal at Soissons or the west façade at Reims both of which are located relatively near Laon and might have been impacted by the chevet rose group (Figs. 36, 37).¹¹⁵ Although the chevet wall at Laon is a far cry from the glass

¹¹³ Claudine Lautier, "Les Vitraux du Chevet de la Cathedrale de Laon," *Osterreichschiche Zeitschrift fur Kunst und Denkmalpflege* 54 (2000): 258.

¹¹⁴ The flatness of the chevet terminal allows for this much glass because there are no lateral thrusts from a circular apse or hemicycle placing constraints on the design. Instead the only limitations forced on the glass of rose windows is the particular ratio of stone to glass needed to withstand the wind loads. For more information on the history of rose windows see Painton Cowan, *Rose Windows* (London: Thames and Hudson Ltd., 1979). For information regarding the structural limitations of rose windows and the effect of wind loads, see Jacques Heyman, "Rose Windows," in *Essays on the History of Mechanics: in Memory of Clifford Ambrose Truesdell*, edited by Antonion Becchi et al. 165-179 (Berlin: Birkhauser Verlag, 2003).

¹¹⁵ The English Perpendicular style would truly capitalize on the idea of making the terminal walls in their cathedrals entirely glass.

walls that will appear later in the Rayonnant, it is possible that the east terminal in Laon sparked experimentation in rose and window design.

The eastern terminal wall of Laon's chevet allows for a large expanse of glass because it is flat. There were no added stresses or thrusts apart from the dead weight of the stone and the wind loads pressing against the glass. In the traditional round chevet design, the stone divisions frequently interrupted the glass because it had to support the pressing thrusts from the adjacent bays which made up the hemicycle. By choosing a flat terminal, the canons at Laon allowed for an uninterrupted plane where the restrictions had to conform only to withstanding the wind loads while serving as an experiment for later glazing designs.

Experimentation was prevalent in the Gothic period, particularly during the early Gothic when the style was still developing. In some ways, the placement of a lantern tower over the crossing at Laon can be seen as a failed experiment. The thin walls of the Gothic style were not suited to supporting a large central tower. The fact that Laon remains one of the only French cathedrals which constructed a crossing tower in the Gothic period implies that there was hesitance in adopting the crossing tower design. This idea is further supported when one considers the pause in constructing the crossing tower while they re-designed the chevet. Although the extension of the eastern arm at Laon breaks from the tradition of French Gothic chevet design, the chevet's new design would have been seen as impressive and allowed more space for the Laon canons to practice the liturgy. While the final chevet design exemplifies Frankl's notion of a balanced and open space filled with light, ultimately, the rectangular shape of the new chevet was probably meant to act as a buttress for the crossing tower. The resulting structure makes Laon a unique and utterly singular example of a French Gothic cathedral.

CONCLUSION

The square chevet of Laon, reconstructed ca. 1205, makes the cathedral somewhat of an enigma within French Gothic architecture (Fig. 1). Although crossing towers were adopted by Norman and Burgundian Gothic structures in the late thirteenth century, the combination of a crossing tower and a square chevet is distinctly characteristic of English Gothic structures, and was never featured prominently anywhere else in France. This phenomenon brings several questions to mind, the least of which inquires why the chevet was rebuilt and why the Laon canons chose an untraditional design. It has been suggested that the square design was intended to create a cohesive feel in the cathedral's interior; but, aesthetics alone are an unlikely justification for the cost and effort to rebuild the chevet, and the unconventional design. Scholars have also argued convincingly that the chevet was dismantled and extended in order to accommodate a need for more liturgical space. No one has previously considered the structural aspect of Laon's change in chevet design.

This thesis addresses these principle questions regarding the extension and design of the chevet at Laon Cathedral, and the crossing tower's role in the change. Laon's construction history reveals that the canons paused the building of the crossing tower part-way through and renovated the chevet during the break. This break in construction implies that the tower may have in part caused the reconstruction of the chevet and the square design. If the Laon canons were concerned about the structural stability of the crossing tower, then it is logical that they would turn to England for a solution.¹¹⁶ England and Laon were in close contact throughout the

¹¹⁶ See chapter three.

eleventh and twelfth centuries, and English Gothic structures frequently paired large crossing towers with an elongated, square chevet.¹¹⁷

Both the square shape of the reconstructed chevet and the presence of a crossing tower are unusual in French Early Gothic structures. Laon Cathedral incorporated both of these uncommon features in the completed state of the cathedral as it is seen today. The act of rebuilding a chevet is rare. Although it was common for canons to renovate and enlarge a cathedral, the complete reconstruction of the chevet occurred infrequently. Each of these factors suggest that Laon Cathedral is a singular example of the Gothic which presents extraordinary circumstances not found in other buildings' histories.

Therefore, the lack of scholarship surrounding the architecture of Laon Cathedral is peculiar. Many scholars choose to focus instead on the sculptural program featured on the west facade. Few scholars have focused their research on the architectural history of Laon. Given the peculiar characteristics of Laon's architecture, it is surprising that so few scholars have discussed the building at length. However, Laon's unusual design may have contributed to the lack of research regarding the cathedral's architecture. The combination of both French and English Gothic elements within the same cathedral may have caused some scholars to consider it as an outlier.

Laon Cathedral is an example of a Gothic structure which does not easily fit in either the English or the French historiographic traditions. In fact the most canonical French Gothic element the cathedral possesses is its west façade. The traditional French Gothic quality of Laon's façade could explain why so much scholarship has focused on the façade's sculptural program and not on the nationally-unidentifiable architecture. Not only is the façade a superb

¹¹⁷ See chapter one for a discussion of Laon's interactions with England and chapter four for Laon's English chevet design.

example of Early Gothic sculpture, but it can be identified as belonging solely to the French medieval building tradition. Despite the dual characteristics present within Laon, the architecture itself warrants study.

Laon Cathedral is one of the best-preserved, extant examples of Early Gothic architecture. As such, Laon Cathedral presents an opportunity to study the development of the Gothic style and how the Gothic may have incorporated Romanesque elements in the early stages. Furthermore, Laon itself served as a source of influence for later Gothic cathedrals. Several cathedrals, including Chartres and Reims, intended to adopt Laon's multi-spire design suggesting that Laon served as a source of inspiration not only for façade sculpture, but for architecture as well. Given its role as a model for later cathedrals, the architectural history and design of Laon Cathedral should not be overlooked or dismissed by Gothic scholars.

It is my hope that this thesis will inspire research which focuses on the interaction between the structure and the design of medieval structures and on Laon Cathedral itself. Furthermore, I believe that my discussion of the Romanesque sources found in Laon Cathedral underscores how the transition between medieval styles of building is often not as linear as believed not so long ago. In the last few decades, many Gothic scholars, including Robert Bork and Marvin Trachtenberg, have questioned the appropriateness of categorizing Gothic architecture and even questioned the term Gothic itself.¹¹⁸ I feel that my thesis follows in this tradition and acts as a specific example of the type of cathedral which would benefit from a cautious usage of these rigid labels. Many of these Early Gothic structures, such as Laon, can be

¹¹⁸ Marvin Trachtenberg suggested that scholars should use new terms in order to move away from the prejudiced and often misleading term "Gothic." He terms Gothic and Romanesque, "medieval modernism" and "medieval historicism" respectively. See Marvin Trachtenberg, "Desedimenting Time: Gothic Column/Paradigm Shifter," *RES: Anthropology and Aesthetics* 40 (Autumn 2001): 5-28; "Gothic/Italian Gothic: Toward a Redefinition," *Journal of the Society of Architectural Historians* 50/1 (March 1991):22-37. Robert Bork questions the use of stratigraphic labels to categorize art history citing these same complex problems. See Robert Bork, "Pros and Cons of Stratigraphic Models in Art History," *RES: Anthropology and Aesthetics* 40 (Autumn 2001):177-187.

re-examined with these methods in mind bringing new information regarding the development of the Gothic style and the methods used to design and construct Gothic structures. Additionally, I hope that my research will foster a newfound interest in Laon Cathedral and that future scholars will give its architectural history the attention and consideration it deserves.

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Figure 1: Notre Dame Cathedral (hereafter termed Laon Cathedral), aerial view, ca. 1160-1220,

Laon, Picardy, France



Figure 2: Laon Cathedral, Plan 1, ca. 1160-1205



Figure 3: Laon Cathedral, Plan 2, ca. 1205-1220



Figure 4: Laon Cathedral, interior, ca. 1160-1220



Figure 5: Laon Cathedral, crossing tower, ca. 1175-1220



Figure 6: Laon Cathedral, choir, ca. 1205-1220



Figure 7: Laon Cathedral, nave, ca. 1180-1185



Figure 8: Laon Cathedral, responds on the north side of the third bay of the choir indicating the

original choir shape, ca. 1160-75 (Clark, 1987)



Figure 9: Laon Cathedral, responds on the south side of the third bay of the choir indicating the

original choir shape, ca. 1160-75 (Clark, 1987)


Figure 10: Saint-Ètienne, crossing tower, ca. 1060-1065, Caen, Normandy, France



Figure 11: Sens Cathedral, nave, ca.1140-1200, Sens, France



Figure 12: Saint Denis, ambulatory vaults, ca. 1140-1144, Paris, France



Figure 13: Saint-Ètienne, nave, ca. 1060-1065, Caen, Normandy, France



Figure 14: Tournai Cathedral, nave, ca. 1130-1160, Tournai, Belgium



Figure 15: Tournai Cathedral, aerial view, ca. 1130-1160, Tournai, Belgium



Figure 16: Laon Cathedral, multi-spire plan, ca. 1160, (Bork, 2003)



Figure 17: Laon Cathedral, base of the missing transept towers, ca.1175-90



Figure 18: Lessay Abbey, nave vaults, ca. 1120-30, Normandy, France



Figure 19: Durham Cathedral, nave vaults with diagonal ribs, ca. 1100, Durham, England



Figure 20: Sant Ambrogio, nave vaults with centralized ribs, after 1117, Milan, Italy



Figure 21: Notre Dame, ca.11th century, Jumièges, Normandy, France



Figure 22: St. Riquier Abbey, building ca. 800, engraving by Paul Petau, ca. 1612 after 11th

century manuscript



Figure 23: Wind Forces on Towers Chart (Mark, 1982)



Figure 24: Chartres Cathedral, multi-spire plan, ca. (Bork, 2003), Chartres, France



Figure 25: Lichfield Cathedral, aerial view, ca. 1195-1330, Lichfield, England



Figure 26: Saint-Ètienne, aerial view of crossing tower, ca.1060-1120,

Caen, Normandy, France



Figure 27: Laon Cathedral, two most eastern nave arcade columns, completed ca. 1185



Figure 28: Abbey Dore, plan, ca.1170, Herefordshire, United Kingdom (Courtauld Institute)



Figure 29: Abbey Dore, transept, ca. 1175, Herefordshire, United Kingdom (Courtauld Institute)



Figure 30: Abbey Dore, square ambulatory passage, ca.1186, Herefordshire, United Kingdom



Figure 31: Engraving of Chartres choir screen, ca. 1230-40, Engraving by Nicolas Larmessin

from the Triomphe de la Sainte Vierge series, ca. 1697



Figure 32: Laon Cathedral, west façade rose window, ca. 1195



Figure 33: Laon Cathedral, chevet rose window, ca. 1220



Figure 34: Chartres Cathedral, north transept rose window and lancets, ca.1235, Chartres, France



Figure 35: Soissons Cathedral, north transept rose window and lancets, ca.1260,

Soissons, France 86



Figure 36: Reims Cathedral, interior of the west façade, ca. 1250-14th century, Reims, France