

GOTHENBURG STUDIES IN CONSERVATION 42

# Interpretations of old wood

Figuring mid-twelfth century  
church architecture in west Sweden

KRISTINA LINSCOTT



GÖTEBORGS UNIVERSITET  
ACTA UNIVERSITATIS GOTHOBURGENSIS



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# Abstract

This thesis explores mid-twelfth century church architectures in west Sweden. The architectures are investigated in the light of a case, five parish churches' naves, in particular their attics and surviving mid-twelfth century roofs. Working from the insight that these roofs were most likely visible from the rooms below, the thesis presents in-depth analysis of the sites, buildings, and their organisation of forms and volumes. The archaeological evidence is approached with architectural perspectives, and the study brings together a partly new view of the mid-twelfth century church architectures.

The churches' attics and roofs have seldom been in the focus in studies that interpret the historical church architectures. Thus, even if the uniquely old roofs are well preserved, we understand only fragments of how they may have been significant. The naves were created in a period before we have specific documentary evidence. Thus, as a study system, the idea that the archaeological physical remains establish 'iterated, performed, articulations' guide the work throughout. The physical evidence is approached with architectural perspectives. The historical architectures are viewed as a matrix for peoples' beings and doings, which means that the architectures were both essential, present 'everywhere', and routine, 'everyday'. The thesis presents relationships between the remains and architectural perspectives.

Based on investigations in the buildings, and a 3D laser scan of one church, the analysis first focus on walls and roofs respectively and thereafter explores relationships between these. The interpretations show that the naves' masonry walls formed a firm and 'cave-like' setting, and that the roofs contrasted with a light and 'lively' character. The roof in one nave, in Gökhem's church, articulates or marks 'zones' in the room below, interpreted as the 'west', 'middle' and 'east'. Thereafter the thesis focus attention on four architectural themes in a sequence of events, i.e. 'discovery and approach', 'portal and doorway', 'entry and exploration' and finally, 'recalled in visual memory'. In these, the focus is on the same church in Gökhem however, some investigations connect to stave churches in Norway, as well as to a woven picture of a church, in a tapestry from north Sweden. In the last part, the thesis cast light on some important subsequent changes. The results provides a basis for future projects, pointing to the importance of the wooden built remains in Sweden and Norway, working from 'site topology', and analysis of medieval built environment from the viewpoint of preserved textiles.

The five churches are part of a Swedish national heritage and they were, together with many other small churches in Sweden, extensively restored during the twentieth century. In this process, they lost some of their local diversity. As we now try to fit these monuments, which have a national identity, into an increasingly complex world with many identities, new understandings of the churches' varying pasts are important. The thesis seeks to strengthen archaeological and architectural perspectives within conservation, and argues to include roofs as particularly significant, in future monument assessments.

**Key words:** architectural analyses, early medieval church architecture, common-tiebeam roofs, early medieval tapestry.

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# Acknowledgements

I am an architect specialised in buildings archaeology. With a background in architectural practice, I have taught in different programs at the Department of Conservation, University of Gothenburg, for a number of years. In the last years, I have also been a PhD candidate at the same department. The dissertation has been an opportunity to work in-depth with a study, in a field I care for. My work brings together archaeology, architecture and conservation. Writing the thesis has been, in part, solitary work. Lately I have spent what feels like too many hours with myself in front of a screen. Here I would like to acknowledge that this was certainly not all. I have had lots of company, encouragement and support on the way.

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# Terminology

**Common rafters** are secondary rafters placed between roof trusses on top of purlins.

**Dendrochronology** is a scientific method for the dating of wood on the basis of analyses of tree-ring growth-patterns.

**Half joint** is joinery in which half the thickness of two timbers has been removed.

**Purlin** is a longitudinal timber that transmits forces from the common rafters to the rafters in the trusses.

**Rafter** is one of two beams in a truss that extend from the eaves to the ridge.

**Roof** is the entire three-dimensional construction.

**Stave church** is a medieval Scandinavian church built with corner posts and upright planks in between.

**Strut** is a timber placed between the rafter and tiebeam in a truss. Struts are often canted, and sometimes in addition crossed.

**Tiebeam** is a horizontal beam placed across the walls and the wall plates. It connects the two rafters in a truss at their base. The tiebeam carries the horizontal thrust.

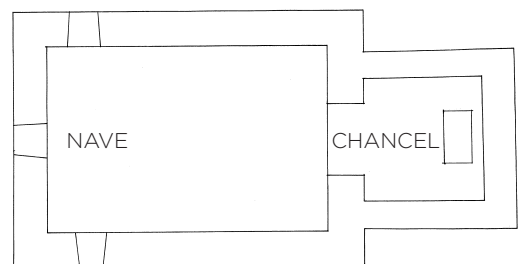
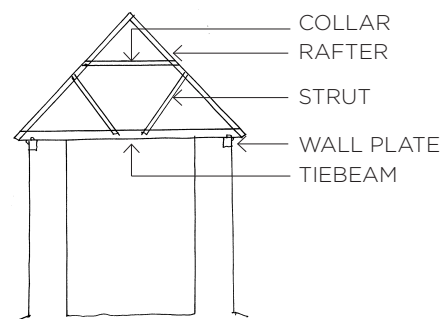
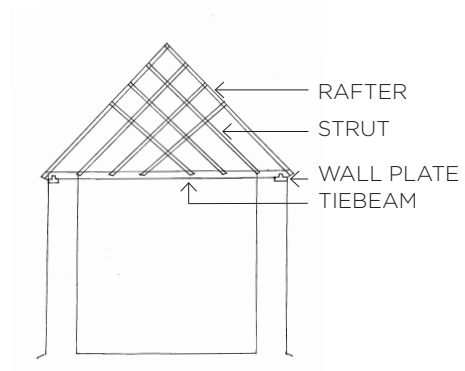
**Trestle** is a horizontal beam lying on two vertical posts, often with inclined struts in between post and beam.

**Truss** is a two-dimensional structure that goes wall-to-wall, on top of the wall plates, across the longitudinal axis of the building.

**Wall plate** is a beam lying on top of a wall, in the longitudinal direction, situated between the masonry and the trusses.

The explanations of terms build on Thelin (2006:17–20).

**cm** = centimeter, **m** = meter, **km** = kilometer





## Intersections in dark attics

This study explores archaeological architectures. The centre of attention are the mid-twelfth century architectures in five church-naves in the region Västergötland, in west Sweden. I approach the earlier architectural articulation in translated form, through interpretations of surviving parts in the standing buildings. Thus, I explore archaeological evidence and analyse with architectural perspectives. The study does not analyse architectural style or interpret religious symbolic elements. The work reflects my position as author. I am not an art or architecture historian, but an architect working with old buildings, trained in buildings archaeology. My search for architecture in the past concerns the sites and their topography, the built structures and their organisation of forms and volumes.

The perspective and concept ‘architecture’ is relatively open. There are a number of different ways to work with, or within, the phenomenon. On the one hand, works in architecture describe buildings and physical structures, on the other, it is the creative activity that is in focus, “the art or science of designing and creating buildings” (Merriam-Webster 2015)<sup>1</sup>. Both the describing and the doing architecture may of course be connected, and overlap in various ways. Writings about architecture are often as open and ambiguous as the concept. Current studies in architecture are, as in many other disciplines, diverse, and they overlap and interact with other fields. From the outside perspective of philosopher Elisabeth Grosz, who explores architecture as a form of knowledge, the discipline architecture, is “unsure as to where to position itself and its own identity” (Grosz 2001:4f). Grosz puts forth that architecture houses or frames bodies, things and volumes, and thus a main task of architecture is “to negotiate how these spaces are to exist in contiguity with each other and how we are to inhabit them in times to come” (ibid:82).

The architect and scholar Simon Unwin writes for “those struggling to *do* architecture (rather than historians or critics)” (Unwin 2015:3). His purpose is to explore the scope, “its

powers and possibilities” (ibid). Unwin finds, based on numerous analysed examples, that architecture frames “just about everything we do in setting the spatial matrix of life” (Unwin 2009:3). Architecture concerns, “the mind’s share: the sense, the order, the organisation of form, the ideas that a mind applies to material in the design of buildings” (Unwin 2015:5). Drawing on Unwin, this work explores the ‘setting of spatial matrix’ in the past. My focus is on how the archaeological twelfth century architecture may have framed people’s activities.

Art historian Elias Cornell points out that architecture is different from other arts, as it has two visual aspects: exterior and interior (Cornell, E. 1959:9; 1966; 1996). Both are important. Further, the sites and structures are bigger than human bodies, and consequently, a person who experience architecture is not in a fixed position, as for example in front of a painting (Shirazi 2014:140–160). Outside or inside, we move around in built environment, and this takes time. Thus, architecture includes temporal aspects. The articulations become apparent in sequences, and people recall the experiences in incarnate body memory (Shirazi 2014:71; Pallasmaa 1996:50, 2012)<sup>2</sup>. For example, people used their sites and churches in the twelfth century, and being there and moving around outside and inside, they ‘mapped’ or encoded sequences of events. Unwin identifies a sequence, which goes from discovery and approach, to entry, exploration inside and finally, recalled in memory (Unwin 2009:37). This work draws on this. I can imagine for example a funeral-procession. People approached and saw the churches from a distance. There were specific pathways and views of the building from the outside. They would gather outside, and enter the inside through a doorway, explore or perhaps rather take possession of the room and, finally [consciously or unconsciously] remember the experiences. In the example funeral-procession, the naves’ architecture framed a collective activity, which likely occurred often, it was a social practise. Probably often, more than one person were in the nave-room at the same occasion. They moved and experienced the site or the room together and from various positions, social or spatial. The practices were multi-dimensional. Notably, this is not about someone, anyone, who may have strolled and looked around. Architectural experiences are subjective, from the point of view of the individual who remembers them.

Cornell writes that architecture emerges as a whole only when it includes both aesthetic and practical sides (Cornell, E. 1959:18f). He argues that architecture loses some of its meaning if it is merely practical or purely aesthetic; “architecture is practical reality aesthetically organized” (ibid:19)<sup>3</sup>. One interest in the thesis is therefore about how the naves’ twelfth century architectures balanced aesthetic and practical aspects.

Once people created their churches, this in turn, had impact on their activities and doings. Buildings outlive us. They stand for generations. Therefore, ‘doing architecture’ is often about managing continuity and changing what already exist. Cornell finds that architecture is, at the same time “foundation, link, and product of human life” (Cornell, E. 1959:10). This is an opportunity for this study. Even if people have changed the churches at a number of occasions, some parts of the buildings are still from the twelfth century. These parts hold performed articulations, materiality that have survived, even if this is mostly hidden under newer surfaces today.



A background to the study is that current understandings about twelfth century societies in west Sweden are formed in a crossing between different disciplines, which use a number of sources. Built remains in standing churches constitute a large part of this. The study material, the five naves, stand out in particular because they include roofs that have survived for over 850 years. The dendrochronological dating shows that the trees were felled in the period 1134–1160s (Seim et al 2015). The roofs are thereby uniquely old in a European perspective, and importantly, they were raised within a limited thirty-year period, only a generation. The five wooden structures are well preserved, they are not in all cases intact, however more or less complete. Thus, it is not necessary, which is often the case, to reconstruct their shape; they are just there ready to examine. Moreover, the five roofs likely covered the same type of room, i.e. naves, built with stone and mortar. Archaeology suggest that builders probably raised these masonry walls in a regional environment completely dominated by wooden buildings (e.g. Augustsson 1995). Finally, again from a European perspective, the five roofs are part of a unique cluster of relatively many preserved roofs, of a particular kind, which occur in the west Swedish region (Courteney & Alcock 2015).

Earlier studies on medieval roofs have focused mainly on the constructions and the joinery (e.g. Sjömar 1988, 1995), truss typology (e.g. Courteney & Alcock 2015; Gullbrands-son 2015; Storsletten 2002) and structural mechanic behaviour (e.g. Thelin 2006). The roofs, which occur in dark attics over ceilings or vaults, are seldom connected to the rooms below. However, Sjömar finds that the twelfth century roof over the nave in Hagebyhöga church in Östergötland, in east Sweden, was visible in the interior originally (Sjömar 1995). Thus, I propose that the five roofs in Västergötland were also visible from the room below when new.

This study finds itself in an intersection between the fields, archaeology, architecture and conservation. However, I lean on both historians and art- and architecture history. I work mainly from archaeological investigations in the five masonry naves' attics. I have also examined parts of three twelfth century stave churches in Norway, and analysed a picture of a church in a completely different material, a thirteenth century tapestry, from the village Skog in Hälsingland, in north Sweden. A goal is to reach new and different perspectives, on the past and the present, which may help us think differently about the future.

### **Aims and objectives**

The overall aim is to create new understandings of architecture in archaeological built environment. The case analysed relates to themes and aspects of mid-twelfth century architectures, which are explored in the light of well-preserved buildings, in particular their attics and roofs. General questions concern how the architectures provided possibilities for experiences and use. In particular, I ask about patterns or variations, and how these could be contextualized.

The search is driven by my interest in how people created their environments, I seek to analyse, interpret and connect sites, buildings and people. I realize that this is not possible. Mid-twelfth century architectures were likely diverse, and the mute remains are ambiguous.

Yet, as I see it, new interpretations of the heritage' archaeological past are important not just to understand better, they are also significant to future conservation projects. We need updated awareness of the past in order to problematize. It is my hope that the thesis helps strengthen both archaeological and architectural perspectives within conservation. I argue that new understandings of the churches' complex and varying pasts, based on empirical research, may contribute to new conservation approaches in the future. In particular, I seek to contribute to the discussion about how the roofs, those 'dusty old things in the dark' may be included in the monument construct.

### **Structure of the thesis**

In the centre of the study are the five naves with roofs in Västergötland. However, the thesis is not a documentation of old naves. The five naves form a case, which is analysed. The thesis is a qualitative study; the empirical materials are descriptive data, not gathered in numerical form.

Chapter 1, 'Earlier studies: Between old buildings and us', seeks to contextualize the questions about architecture as well as the case, through earlier studies. The purpose in the first sub-chapter [1.1] is to sketch a background to churches in the province Västergötland in the twelfth century. Next to all works on churches from this period relates to the European architectural style, the Romanesque. This both identifies the architecture, and dates the buildings. Thus, in the second sub-chapter [1.2] I examine the theoretical notion 'Romanesque style'. I ask about how the stylistic framework may connect to my search for architecture. In the third sub-chapter [1.3], I propose to go beyond a stylistic framework in this work, and seek new models in archaeological studies. Finally, extensive twentieth century restoration projects gave the five churches the character they still have, and they are not alone in this; they were part of a national Swedish movement. Thus, in the last sub-chapter [1.4], I seek to sketch a background to the restorations, the scope and the result. The purpose is to contextualize the materials and constructions, which were present in the five churches, in the years 2012–2015 when I investigated them.

Chapter 2, 'Walls: shaping a firm box', pictures original walls and openings in the five naves. The question asked is, what walled structures did the mid-twelfth century roofs cover when they were first put in place. I work largely from archaeological investigations of wall crests and gables in the five nave's attics. The possibility to examine the walls below is limited today. Therefore, the analyses build on understandings gathered by antiquarians and master masons during earlier restoration projects, available in archives. In the first sub-chapter [2.1], I highlight one of the five churches, Forsby, and discuss interpretations of the nave's original form. The second sub-chapter [2.2] build on the interpretations from Forsby, and the focus is on different parts in the five naves thematically.

Chapter 3, 'Roofs: Adding a lively top', focuses the five roof constructions. The chapter explores the character of the 'top' of the five nave rooms. Two questions guides the

work, 1) what are the characteristic features of the five roofs, and 2) how do the wooden constructions relate to the room below? The chapter is largely based on archaeological investigations in the attics. In the first sub-chapter [3.1], I account for wood materials, recurrent construction principles of the common-tiebeam roof type and its distribution. I introduce questions about the seemingly close spacing and large numbers of tiebeams in the five roofs, and link them to other similar roofs in Västergötland, which Gullbrandsson presents in his catalogue (2015). The second sub-chapter [3.2] seeks to understand the significance of the relatively large number of tiebeams in the five roofs. I search for alternative twelfth century roof structures, with fewer tiebeams. I propose that there was a connection to wooden building practices, and examine the intersection between tiebeam and wall plates. In the third sub-chapter [3.3], I propose that the roofs were not mere roof-carriers. I examine them as active parts of the interior. The focus is on the various shapes that the struts form, and the sense of flowing and billowing. The fourth sub-chapter [3.4] seeks to take the question about connections between the roof and the room below further. I explore how different parts and forms in the roof in one of the five churches, Gökhem, are oriented, placed and gathered.

Chapter 4, 'Body and volume: Firm box with lively top', first sketches the combination of the previous analyses of walls and roofs, which is [outside] body-in-space and [inside] volume-room. Thereafter the investigation moves along the path identified by Unwin, from discovery and approach, to entry, exploration and, recalled in memory. In sub-chapter [4.1], the attention is on the mid-twelfth century site-topography in Gökhem. I ask about a suitable pathway to enter of the nave, as well as a place for outdoor ceremonial activities in front of the entrance. In sub-chapter [4.2], I visit three portals in stave churches in Norway, which help contextualize the situation in Gökhem. In sub-chapter [4.3], I explore the nave in Gökhem, and ask how the different elements of architecture may have worked together in the interior. Sub-chapter [4.4] leaves Gökhem to contrast the interpretations from archaeological built remains with analyses of how a weaver recalled a church in a picture. The image occur in the thirteenth century tapestry from Skog. Finally [4.5], the thesis comes back to the archaeological evidence in Västergötland. Here I seek to contrast the mid-twelfth century architecture by casting light on how people subsequently changed it. This is a tale of 'the end of the tiebeam game'.

Chapter 5, 'Discussion: Homage to ambiguity', concerns the relations between the empirical materials [based on physical and instrumental data], the theoretical approach, how the study was delimited, and the analysed results. This regards first the investigation of original walls and roofs, i.e. 'basic elements' of architecture, combined with 'modifying' elements, which come into play once a building is in place, e.g. light and sound. Next, I discuss the results from the investigation of temporal aspects in a sequence of themes. Thereafter I discuss the results, how the analysis of original architectures reveal iterated patterns and variations and connect sites, buildings and people. Future perspectives are sketched in connection to this, as well as the overall aim of the study.

## Theoretical approaches

The exploration pays attention to one specific period, the mid-twelfth century. However, the architecture in the distant past is not obvious in the buildings today. A way to explore and analyse is to focus on different mid-twelfth century building parts separately, i.e. sites, walls, openings, roofs, volumes. I view the remains of built parts as the results of repeated, similar activities 850 years ago, which were performed in the same region. Thus, my work explores the physical consequences of peoples building activities. Their actions may have been deliberate or routine. They may have had diverse motives, and we will never know which. With this view, I approach the empirical material with both archaeological and architectural theory.

Unwin finds that the activity ‘doing architecture’ begins with the desire or need to establish a place or places (Unwin 2009:9, 2015:8). He argues that the fundamental motivation for architecture is to “identify [recognize, amplify] places where things happen”, and making architecture is therefore a way to communicate (Unwin 2009:9). Unwin works with two different kinds of elements in his analyses, ‘basic’ and ‘modifying’. Basic elements of architecture are components such as the ground [e.g. a defined and marked area], walls, openings [doorways and windows], floors and roofs (Unwin 2009, 2015:8). Each element may do more than one thing for example; a wall may be both a barrier and form a pathway (ibid). Modifying elements, Unwin argues, come into play once the basic elements are in place (ibid). Examples are light, temperature, scale, texture, sound, fragrance, time or possibilities for movement (ibid). Light through a window would for example break up the enclosed experience of a walled room.

Unwin combines the elements in themes, where he suggests the architecture ‘frames’ activities and objects. He gives a large number of examples. These include the experience of ‘moving’, for example discovery, approach, entry, exploration and finally in memory (Unwin 2009:37). Further Unwin brings in other architectural themes like the ‘focus point’, for example a fireplace, the ‘in-between’, for example a doorway, as this is not fully outside or inside, the ‘barrier’, like walls, and ‘refuge and prospect’, for example the relationship between a small place and its view over a surrounding area (2009:105; 2015:8). My analyses draw on Unwin’s approach. It offers a suitable theoretical tool for analyses of architecture in archaeological buildings. The different basic elements of architecture form volumes. The shape of volumes may differ, and they may occur outside as well as inside a room. The volumes may interact with other physical elements, such as light, which shines through a window, which break up a closed walled room. The different elements related to each other in specific ways in the past, and together they formed architectural ‘themes’ which can be explored.

Similarities [and differences] in how people shaped their naves, can be analysed within the framework ‘Micro-archaeology’ (Cornell & Fahlander 2002:39, 2007). The theory deepens the understanding of different sorts of social groups. Cornell and Fahlander draw on philosopher Jean-Paul Sartres’ discussion about ‘seriality’ (2002:15)<sup>4</sup>, as he distinguishes between two types of relationships, ‘series’ and ‘groups’ and explains that individuals who

are part of a series are united simply by a common way of acting (ibid:41)<sup>5</sup>. Individuals in a series may or may not have some other fellowship; however, it is their common way to act that unites them<sup>6</sup>. Thus, people form collectives through their patterns of behaviour (ibid). By contrast, a group of members have relationships, and the individuals identify with each other. With this understanding of seriality, the building activities in each nave can be put into larger frames. The different parts, the roofs, walls, gables, ceilings, vaults, volumes, windows and entrances, can be analysed both separately and together.

The five churches have had a very long existence compared to us humans. Numerous generations have re-used and re-experienced them, and having a church was, before long, about managing and developing what already existed. The buildings are thus charged with multiple, ambiguous and changing meanings. Even when new, they were probably shaped according to proven concepts. Glassie finds that,

No building is entirely new. If it were, it would be utterly incomprehensible. Rejecting every old convention /.../ the thing might be a sculpture, but it would not be a building. No matter how grandiose or revolutionary the creation, there must be some tradition, some presence of the common and continuous /.../ or people would not be able to understand it or use it (Glassie 2000:275).

The concept 'iterated' is used here to understand that the idea of making a church 'as it should be' or 'as earlier churches' may have been important when people created new, or transformed old local places for worship. Iterated thus means, copying or borrowing from something that already exists (cf. Cornell, Rosén & Öbrink 2015). However, the idea or role model for a particular articulation, which would turn a building into 'a church', was probably difficult to copy precisely in the local contexts. Thus, the buildings that we interpret today were the results of iteration rather than repetition (Cornell & Hjertman 2013:9–29; 2014:587–606). There were variations. When trying to repeat the model, i.e. what a proper small Christian church should be; minor changes were probably made in the new context. The builders were perhaps confronted with other building materials. The local builders had to handle new and foreign requests. The new churches would be similar but never identical and their cultural significance must have altered or changed to some extent.

The search is thus for performed, iterated architectural articulations, in each built element as well as in themes of architecture. The focus is on the parts in the buildings, patterns of the same kind of building activities, primarily in a region, and in a specific period. However, the analysis of common ways to act [to build naves], may help understand similar patterns and processes also in different geographies (Cornell & Fahlander 2007:7f). Micro-archaeology offers a possibility to discuss practices independently of their assumed cultural origins (ibid).

### **Study materials**

In this part, I introduce the main study material, five church naves. The three stave churches in Norway and the tapestry in Stockholm are presented in chapter four. The five naves are far from alike. However, they have some things in common. The focus here is on what they



**Fig. 1.** The locations of the five churches, in the west-Swedish region Västergötland. Denoted the small town Skara, which is the center of the Diocese Skara, and also Stockholm, Gothenburg and Oslo.

have in common today. Apart from the twelfth century walls and roofs, they are located at the same type of sites, and have been through a number of similar changes, for example the installation of large windows.

The five church buildings are all located on a slope or a small hill. Examples are the neighbouring churches Gökhem and Marka, which both are placed high up, right on the border to farmland below. All five churches were placed right next to, or quite near, small flowing waters and springs<sup>7</sup>. The sites may have a pre-Christian history. Almost 40 churchyards show such continuity in Västergötland (Gullbrandsson 2008b:12). Forsby church has a visible pre-Christian connection as the church was placed on the very top of a burial mound from the Iron Age (Fornsök Forsby). The other four churches are also located, if not on top of, in the vicinity of identified pre-Christian graves (ibid). Walls of stone more or less surround the five churchyards.

The present naves in Forsby and Gökhem are described here as examples. They have much in common. Both naves are rectangular and generally oriented west-east, even if Gökhem is slightly off the capital directions. The nave walls are around six meters high, and the rooms are about as high as they are wide. The thick masonry walls in limestone are whitewashed and partly decorated. A large triumphal arch in the two naves' east wall gives access to a

smaller and lower chancel. Large windows in the north and south walls let a great light in. The floors are of limestone and wood. Forsby nave has a flat ceiling of boards, which was decoratively painted in the eighteenth century. The nave in Gökhem is vaulted and was decoratively painted in the fifteenth century. The nave in Forsby has a main entrance in the south wall and a door to a small porch in the west wall. The nave in Gökhem has an entrance to a porch in the north wall. Most visitors do not take any notice of the roofs as the trusses are hidden over the ceiling or vaults. It is not easy to climb up in the attics, and they are completely dark.

A few objects are possibly from the earliest period. However, these are largely collected in museums. Forsby church is an example. The cylinder shaped font made of sandstone is still in the church. However, two wooden figures that used to belong to the interior, have been moved to museums. One is of Christ, originally mounted on a cross; now in the Swedish History Museum in Stockholm (SHM). The other is of Maria (Rahn 2002:24); now in the Museum of Gothenburg. An inventory from 1828 (ATA Forsby) reveals that the two figures were then still in the church, but put aside in a corner<sup>8</sup>. A few surviving medieval textiles are also collected in the Swedish History Museum in Stockholm.

All five churches have been restored during the twentieth century. Forsby church for example was restored extensively, twice. The architect Axel Forssén conducted a restoration project in 1933 (ATA, Forsby). The project included reparations of the walls both outside and inside. The attic was cleaned from loose items and everything including the trusses was, according to the instructions, swept. In 1979, the facades were restored again. This time, more or less all outside plaster, older and newer, was removed with a jackhammer (*ibid*). Gökhem, Marka and Gamla Eriksberg churches have been subjects to more or less the same measures, also in two phases during the twentieth century (ATA).

### **Investigative methods**

To accomplish the investigation I have visited the five churches Forsby, Forshem, Gamla Eriksberg, Gökhem and Marka a number of times, and made observations. The investigations started in a previous project, a field study that was conducted in 2011–2012, which resulted in a report to the Diocese Skara (Linscott 2013)<sup>9</sup>. The fieldwork for the thesis, sampling for dating with dendrochronology, 3D laser scanning, measuring and drawing by hand, and taking photos and notes, took place in the summer seasons in the years 2012–2015. The fact that the fieldwork went on for a number of years means that I had a somewhat different understanding during the first and last investigations. I could observe conditions in the latter that I had not noticed in the beginning. The significance of the traces in the masonry gable tops, for example, I did not realize or take seriously at first. I was so focused on the wooden structures. The gables importance became clear to me gradually, drawing, reconsidering and re-examining.

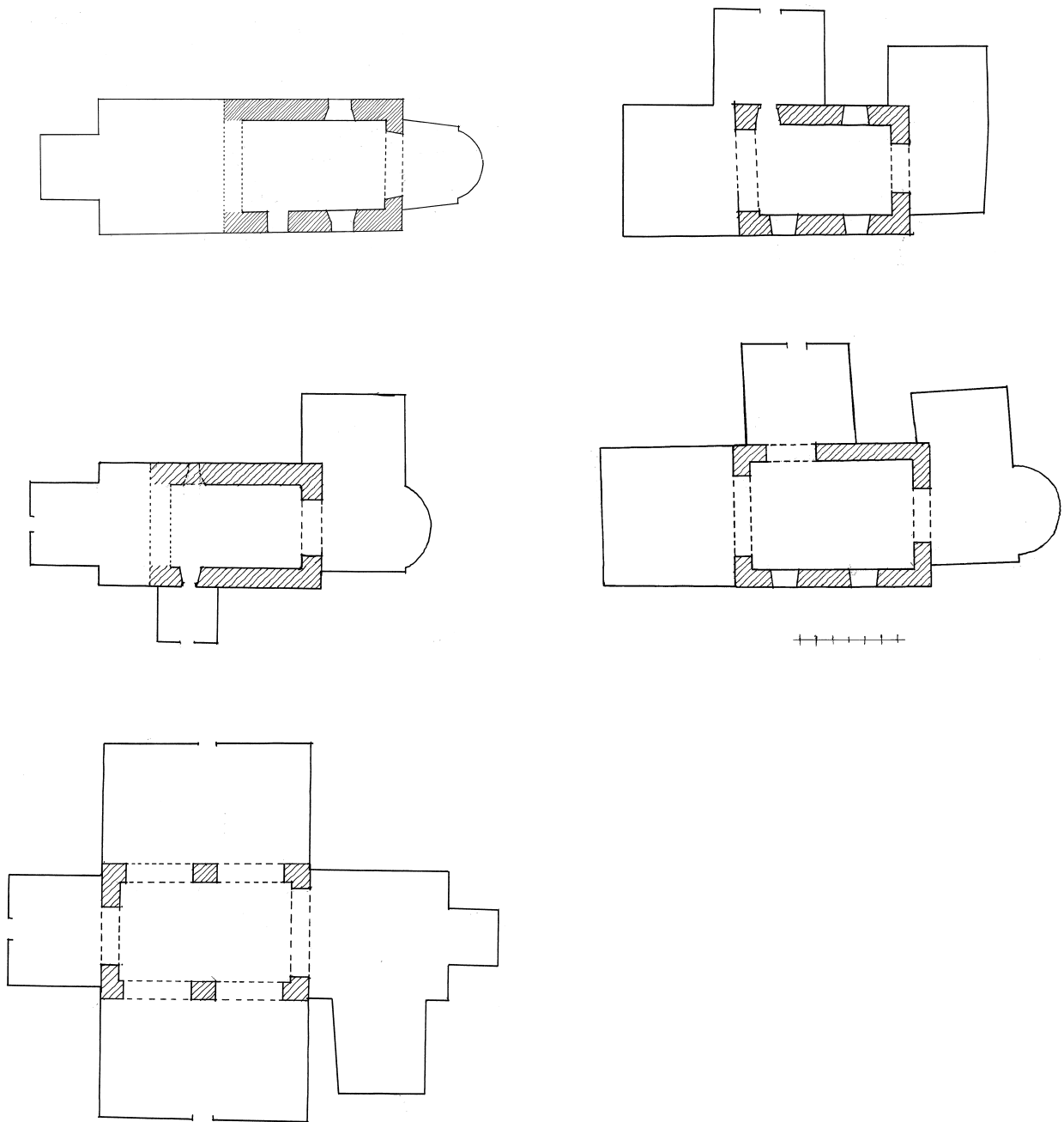
To provide precise dating of the five nave roofs, dendrochronology and buildings archaeological investigations were combined, in a separate and parallel project called 'Diverse



**Fig. 2.** The five churches, exteriors. **Above left** Forsby from southeast [N 58° 23' 23,38", E 13° 56' 13,68"], **above right** Marka from southeast [N 58° 9' 31,78", E 13° 28' 51,45"]. Photo 2014. **Below left** Gamla Eriksberg from southeast [N 58° 1' 49,01", E 13° 16' 17,27"]. Photo 1899 ATA. **Below right** Gökhem from southeast [N 58° 10' 25", E 13° 24' 27]. Photo 2012. **Underneath** Forshem from northeast [N 58° 37' 11,94", E 13° 29' 23,86"]. Photo 1889, ATA.

The photos of Forsby, Marka and Gökhem show the similarly white and well-kept façades, which characterize them today. The church Gamla Eriksberg is quite like these today however, as an example; the photo from 1899 reminds us that this was not always the case. The church in Forshem is different, as the nave has been completely built in with subsequent additions on all sides. The picture from 1889 shows, apart from the road and churchyard, next to the same exterior as today.





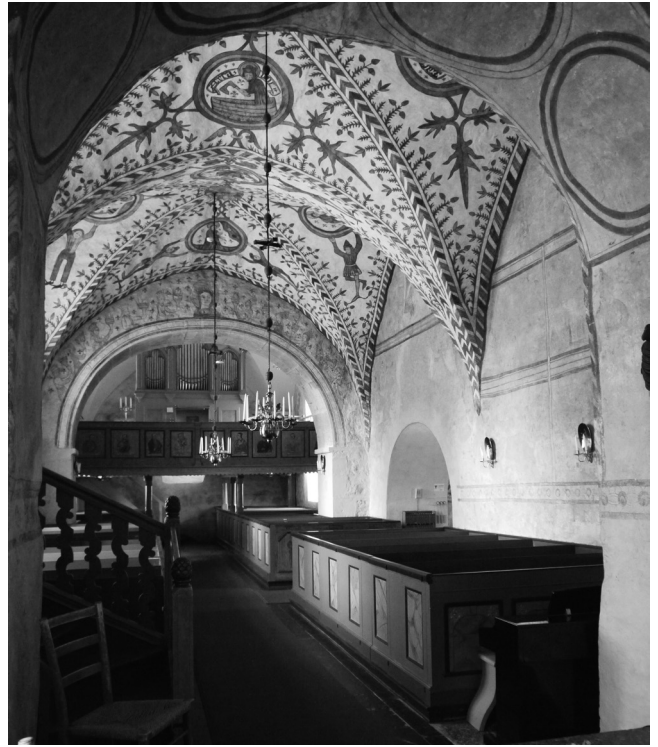
**Fig 3.** The five churches plans. North is up in all drawings. The naves are denoted. **Above left** Forsby, **above right** Marka. **Below left** Gamla Eriksberg, **below right** Gökhem. **Underneath** Forshem. The naves are in all cases added on to, with subsequent structures.

construction types and local timber sources characterize early medieval church roofs in southwestern Sweden', which I was part of together with my colleagues dendrochronologists Andrea Seim and Hans Linderholm. We examined the attics and looked for waney edges in the timbers, during the summer seasons in the years 2012–2014. Andrea Seim took core samples from selected timbers, in total, 10–30 samples from each church. Andrea Seim identified the species of the timbers microscopically, and measured the tree-ring widths [TRW] and cross-dated<sup>10</sup>. The analysis compiled dating of seven separate roof structures within the four churches, Forsby, Forshem, Gökhem and Marka. The results have been presented in an article (Seim et al. 2015). Three roofs in Gamla Eriksberg church were dated in the same way in 2015, this result is included in a report (Seim & Linderholm forthcoming).

A 3D laser scanning of one church, Gökhem, was completed. Measuring expert Jörgen Spetz and his colleagues conducted the fieldwork at two occasions, during each a day, in the years 2013–2014<sup>11</sup>. Spetz selected and provided suitable equipment, collected the data, and processed the point-cloud. As the attic contains so tightly spaced trusses, each with six struts, the limited visibility was a challenge. A series of scans from different positions were required. The scanner was put up in six different places in the attic. It was difficult to find straight lines, so that the different point clouds could be related to each other. To scan the whole site and church in Gökhem required 74 setups. The dark attic was scanned without colour however, in the rooms below colour was established with panorama photography. The main laser scanning was supplemented with a hand-scanner for more detail in some selected places in the attic. The giant point cloud provides a multitude of raw data for new 2- and 3D sections and views in all directions. A scanner measures the distance from itself to a point on the surface of the object. This is determined by the time it takes for the laser to travel to the object and back. Once it is set up, a scanner does not select data. The laser beams hit all the different parts of the building, but also, indiscriminately specks of dust, drops of water, spider web and people moving around. During this time, you need to be still and keep out, not to disturb the scanner or stir up dust.

Researchers in the fields of archaeology, architecture and art-history have a long tradition recording by hand, and measured drawings of buildings are discussed from various perspectives in a number of studies (e.g. Almevik 2012; Eriksdotter 2005; Gustavsson 2014; Hansen 2000:7–21; Sjömar 2000:63–84). Architect Erik Hansen writes that until the 1950s, most drawings were made in a picturesque manner; they are like 'portraits'. In these, little or no attempt was made to analyse (Hansen 2000:11). Danish architects developed a different, analytical drawing method during the second half of the twentieth century (Hansen 2000:14–20; Hansen 2008:11–34). These were related to archaeology and included analyses and rigor in detail. The drawing technique builds on agreed signatures, codes. The purpose

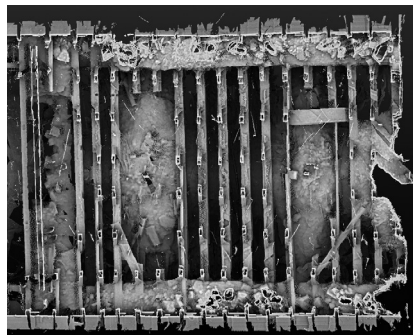
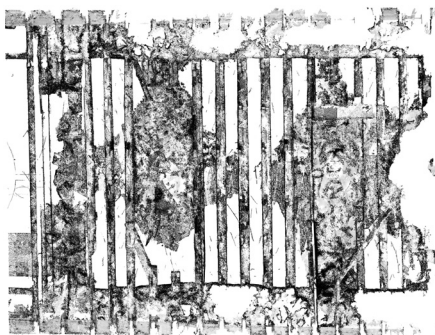
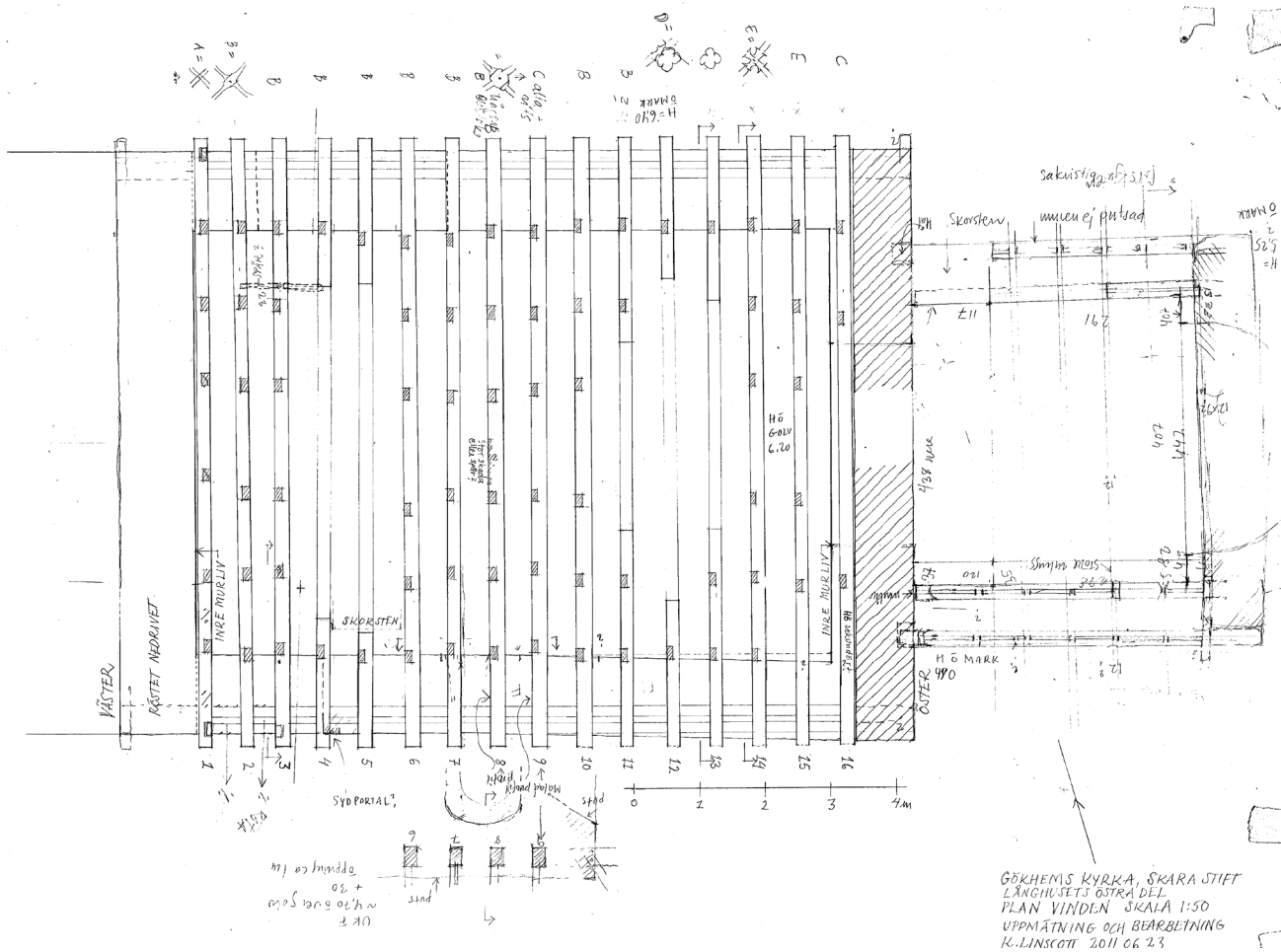
**Fig. 4.** **Above left** is the interior in the nave in Forsby towards the chancel. Photo 2016. **Above right** the interior in the nave in Gökhem towards west. Photo 2016. **Below left** one of two medieval fonts in Gökhem. Photo ATA. **Below right** the wooden figure of Christ originally mounted on a cross; now in the Swedish History Museum in Stockholm (SHM). Photo 2016.



is to give schematic explanation of only those observations, which are of interest (Hansen 2000:20). Abstraction is wanted. Hansen points out that “no line can be put on the paper until the researcher has made clear what it means” (ibid:18). The researcher asks questions about what should be included- drawn- and what should be left out and thereby gets actively involved. The stones and timber give answers, more or less readily. Hansen points out that the researcher both influences the investigation and contributes with experience, i.e. the observer inter-acts with what is documented (ibid:20). The result of such a process has been negotiated and depends on the researcher’s experience, skill to make the drawings and of course, the purpose of the investigation (Hansen 2008:28f).

Being a student of Hansen I have conducted similar analytical hand-drawings in this work. To measure and draw, a coordinate system was established with a small laser tool. As with the 3D laser scanner, it was not always easy to find proper places for straight lines in the crowded attics. The measurements were taken with ruler, tape- and laser distance measurer, helped by a plumb. Contrasting being quiet around the 3D laser scanner at work, taking measures by hand means that the researcher is physically very active. As I see it, I was myself a measuring tool moving around, bending down, stretching up and holding on. Fingers could touch and feel were the eyes [or laser beams] do not reach around corners or in under something. In some cases, small mini-excavations were carried out, getting rid of bird nests and dirt. Providing sufficient light is important in the dark attics, and it was a new experience to work with powerful LED lights. This contributed to the quality of the work. Making principal drawings of the attics in the scale 1:50 was the first step. Using the coordinate system, and taking the measures continuously and systematically, an error will not be accumulated, and this would also be easy to identify immediately. Next step was to make detailed investigations in the scale 1:10 or sometimes 1:5 and even 1:1. These pencil-drawings were more or less completed in the attic, however gradually, at several occasions. The challenge was to decide what drawings to make, and to find the best places to take the measures. This requires pre-understandings of old buildings and experience in work with buildings’ archaeology. In the process, I seek to get rid of unnecessary information, a lot is excluded and relatively little is included. What was drawn depended on what I observed and thought relevant there and then. It is easy to miss important things, simply because the traces are not well preserved, ambiguous or difficult to interpret. Interpreting includes thinking and re-thinking at the site, in relation to questions. Other researchers would see other things and not value the observations in the same way. In addition, the material was obtained at a certain point in the buildings’ long existence, and the buildings will not stop changing because I was there recording. We have already changed, both the buildings, tools and myself, as I now write, in 2017.

Obviously, when we record an old building by means of various tools, these create quite different outcomes. Thus, the fieldwork, the interface between the researcher, tool and building is significant. I chose to make a church the object of knowledge. The building was the focal point, it was observed from different perspectives. I measured and made a few projected drawings, and my colleague Jörgen Spetz put up a scanner and obtained point clouds.



**Fig. 5.** Above, the plan over the attic in Gökhem as drawn by hand 2011–2013. Below left, the plan over the attic in Gökhem in a raw point-cloud, only dust in the air removed. Below middle, the plan in a cleaner version. Spetz 2014, 2017. Below right, the tools I used for the investigations in the attics, measuring and drawing by hand. Photo 2012.

Whatever method, we wish for an accurate documentation. However, it is not possible to make a complete copy of the reality with either. Further, even if refined techniques would create ever more life-like images, is this enough? My investigation began recording what was visible and familiar. However, I also searched for phenomena that I did not know. Thus, the created image should show more than the original, not only what was visible, but also characteristics that were hidden behind surfaces and emerge with analytical thinking. What I really wanted was interpretations. This means that the task was to make a translation, rather than a copy-representation. This could be compared to a clinical performance, a ‘walk along’ interview, carried out in direct physical contact with the constructed materials in the building.

This study uses drawings and images not only to investigate the buildings, but also to communicate the interpretations about the past. How to do this well, is not easy or obvious, this is a field of research in itself (e.g. Westin 2012). Here I only briefly touch on some advantages and problems that relate to this work.

On the one hand, images are essential to this study as they communicate something’s shape, size, proportion and volume, as well as orientation, easily and exactly. Those properties are very difficult to write or explain in any so many words. Images have precision. Writing on the other hand, has the advantage that it allows the communication to be ambiguous and uncertain. I can for example write that a building had a door in this place in the past, even if I have only observed a trace. I do not have to account for exactly what it looked like.

Images may contribute with vividness to an account of the past however, if I try to make an image of the situation ‘a door in the past’, I have to decide about the width and height, as well as the precise form. Which I cannot. The historian Carlo Ginzburg finds that images are problematic (Ginzburg 2012:10), and cites Plutarch who compares a painting [of a battle] to a written description of the same event. Plutarch argues that “painters portray [the battle] as taking place at the moment”, while “literature narrates and records [the event] after they have taken place” (cited in Ginzburg 2012:11). Plutarch thereby highlights an important difference, regarding the two modes’ relation to past and present tense. Images strongly lead the viewer into a sense of present tense. It is indeed difficult to communicate that ‘this was in the past’ visually, without commenting on it, in writing. This means that as much as the precision and clarity in drawings, scans or photographs, are advantages when investigating the present building, the same properties become serious difficulties when trying to communicate interpretations of the past. Even if probably impossible, I seek to follow Plutarch as he continues, arguing that, “the most effective historian is he who, by a vivid representation of emotions and characters, makes his narration like a painting” (cited in Ginzburg 2012:11).

## Notes Introduction

- 1 A variation of this would be “the art or practice of designing and constructing buildings” (Oxford). It is as well a characteristic, e.g. “the style in which a building is designed and constructed, especially with regard to a specific period, place, or culture” (Oxford). In addition the term architecture can describe other structures, which not refer to buildings, e.g. “the chemical architecture of the human brain” (Oxford), or the “architecture of the garden”, or in a book e.g. “the novel lacks architecture” (Merriam-Webster).
- 2 I thank Annika Bünz for bringing the references in Shirazi and Pallasmaa, on body memory and sequences, to my attention.
- 3 In Swedish in a later text, ”Arkitektur är estetisk organisation av praktisk verklighet” (Cornell, E. 1966:9).
- 4 The authors build notably on Sartre’s theory of seriality [1960], however they point out that similar approaches can to some extent be found in Foucault’s ‘archaeology’ [1969], and Giddens’ ‘structuration theory’ [1984].
- 5 Sartre’s understandings of ‘groups’ and ‘series’ have theorized other studies of architecture, with different interpretations (e.g. Werne 1987:12f).
- 6 Cornell & Fahlander explains that the [traces of] situations where people have acted the same and thus constituted a collective, is “the starting point for socio-cultural analysis of spatial and time-based dimensions” (Cornell & Fahlander 2002:39).
- 7 In: Forsby: Ösan and Lillån, Gökhem: Källarsabäcken, Källedal and Mänsakällan, Forshem: Sjörsån, Gamla Eriksberg: Sankta Brittas källa, Lidan, Marka: between two inflows to Sjötorpasjön.
- 8 My interpretation from Swedish, ”I Choret står en Döpelse Funt af huggen sten, och i en vrå af kyrkan tvänne gamla, mycket förstörda, Träbeläten”.
- 9 The fieldwork included attics in the churches Forsby, Forshem, Marka, Gökhem and Jällby in Västergötland.
- 10 Tree origin and forest stand density was estimated based on a combination of average growth rates [AGR], growth patterns, tree ages and mean segment lengths [MSL] (Seim et al. 2015).
- 11 Financed by the the department Measurement Technology at the Technical Research Institute of Sweden, SP, now Research Institute of Sweden, RISE, in Borås. A phase scanner HDS7000 was used.





## Earlier studies: Between old buildings and us

The five churches in the province Västergötland are today designated monuments; they have been part of a national Swedish cultural heritage for about a century. During this period, the early churches in Sweden gained much interest, they have both been the objects of research and they have been subjected to restoration.

Many earlier studies on twelfth century churches approach the buildings with art-historical perspectives. In Sweden, a large number of such studies belong to the Swedish national inventory [*Sveriges kyrkor. Konsthistoriskt inventarium*]<sup>1</sup>, which started in the beginning of the twentieth century. One example, which is particularly important to this work, is the comprehensive study “The parish-church project”<sup>2</sup> (Dahlberg & Franzén 2008). This gathers understandings of small local churches from all regions in Sweden. However, the search for art- and architectural history does no longer dominate in newer studies. A survey covering more recent church related studies<sup>3</sup> in Sweden, which focus on the years 2009–2014, identify four themes that stand out: 1) physical management, 2) shift in significance and heritagization, 3) the church as art- and cultural historical object and 4) the Church and liturgical use in the past<sup>4</sup> (Persson et al 2014:31). The authors find that a majority of studies still focus the cultural heritage itself (ibid:33). However, the focus of interest has shifted from interpretations of historical art- and architecture, to issues concerning preservation or physical maintenance and management (ibid:34). This study, with combined legs in architecture, archaeology and conservation, does not fit entirely in either of these two categories. However, it relates to both. The search for architecture, and how it housed people and things in the archaeological past, belongs to the theme ‘historical art- and architecture’. Even if I do not approach the buildings with art-historical perspectives, I do relate, and lean on to this important field with a long tradition. At the same time, the study belongs to fields concerned with different aspects of preservation, maintenance and management, as the thesis seeks to contribute with awareness of the monuments’ architecture in the past.

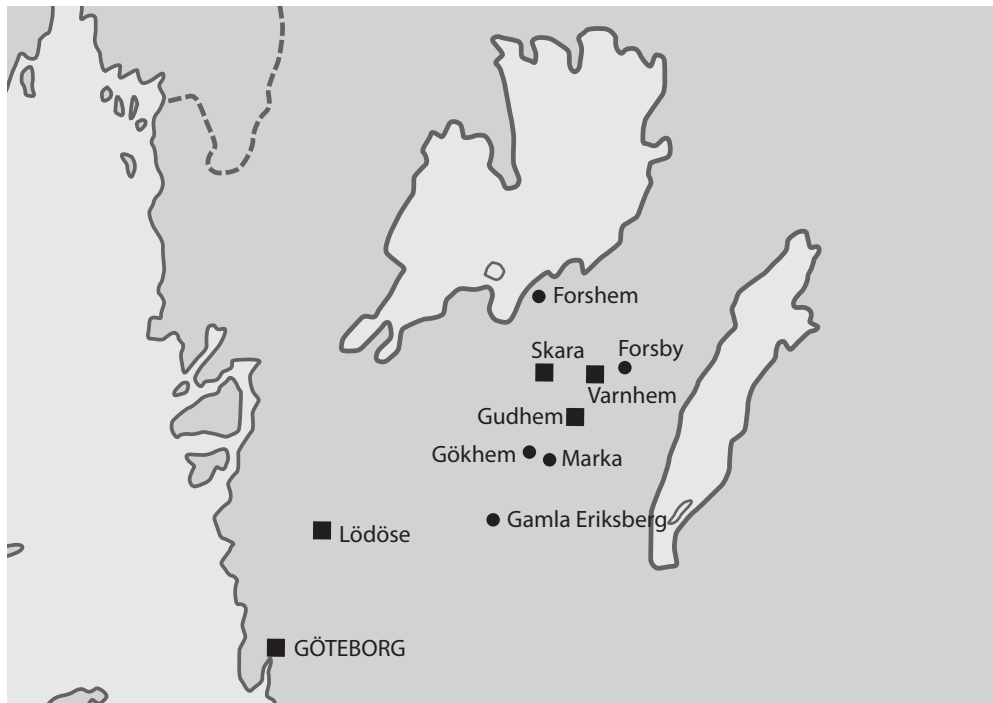
The aim in this chapter is to contextualize the thesis' questions about architecture, as well as the case, the five naves, through earlier studies. The purpose in the first sub-chapter [1.1] is to sketch a background to the case, the five churches in the province Västergötland, at the time when their naves were new. This is about the societies and the built environment in the twelfth century, the province' 'church-scape'. Next to all works on church architecture from the twelfth century relates to the European architectural style, the Romanesque. The style both identifies the architecture, and dates the buildings. Thus, in the second sub-chapter [1.2] I examine the theoretical notion Romanesque style, which has been in play in Sweden for more than a century, and longer in Europe. The questions concern how the stylistic framework connects to the search for architecture in this work. Thereafter, in the third sub-chapter [1.3], I propose to go beyond the stylistic framework Romanesque, and seek new models in archaeological studies.

Finally, the five churches have been subjected to extensive restorations during the twentieth century, in some cases more than once. These gave the five churches the character they more or less still have. They are not alone in this; they were part of a Swedish movement. Thus, in the last sub-chapter [1.4], I seek to contextualize the materials and constructions, which were present in in the five churches in the years 2012–2015 when I investigated them.

## **1.1. IN THE OUTSKIRTS OF THE CHURCH DOMAIN**

The province Västergötland is an inland area. Towards the west and the sea, it borders two coastal provinces, Bohuslän and Halland<sup>5</sup>. Yet, Västergötland has access to considerable and important waters and rivers. The big lake Vänern is located in the northwest, and towards east, the long narrow lake Vättern creates a border to the province Östergötland. The large flow Göta älv connects Vänern to the coast and sea, and two rivers, Tidån and Lidån, run across the province and let out in Vänern.

Twelfth century Västergötland had only two small towns. The trading town Lödöse gave access to the sea through Göta älv. Lödöse was probably established in the eleventh century, and the town developed during the twelfth (Carlsson 2007; Harlitz 2010:157). A written record on Lödöse is from the year 1151 (Rosborn & Schimanski 1995:26). The other town is Skara, which is a 'church' town, the centre for the Diocese Skara. Skara is located further inland, about 100 km northeast of Lödöse, on the plain between the two lakes Vänern and Vättern and the rivers Tidån and Lidån. There is some uncertainty about precisely when the town Skara became the Diocese centre (Dahlberg 1998:71) however; in 1140 when a "Romanesque Cathedral" was consecrated (Rosborn & Schimanski 1995:25), it certainly was. Four of the five churches, Forshem, Forsby, Gökhem and Marka, are located at a relatively short distance from Skara, only about 30 km, perhaps a day's walk on good trails. The church in Gamla Eriksberg is located on an inflow to the river Lidån, further from both Lödöse and Skara. The population in Västergötland probably increased during the twelfth century, as in many other parts of Scandinavia and Europe, and thus, people would have



**Fig. 1.1.** The locations of the five churches, in the west-Swedish region Västergötland. Denoted the small town Skara and Lödöse and the monasteries, Varnhem and Gudhem.

expanded the inhabited areas, and established new settlements (cf. Myrdal 2004:196). Yet, large forests still parted the two towns, as well as the farmed areas.

Being part of a Diocese, the societies were formally incorporated in the Christian Catholic Church domain. However, people here had likely been Christians for at least a century or more before this (e.g. Theliander 2005; Vretemark 2013). Further, the societies had a common law (Wiktorsson 2011a:29). A written copy of the law, the ‘The Older Västgöta law’<sup>6</sup> [*Äldre Västgötalagen*] is dated to the 1220s (ibid:11)<sup>7</sup>. No written copy has survived from before this, and therefore, it is debated whether a law for the province was oral or written down during the twelfth century (ibid:29). The Older Västgöta law includes a list of previous ‘law-speakers’ [*lagmän*] (Wiktorsson 2011b:193–195), which were men who could recite the law. It also provides lists of bishops (ibid:205) and kings (ibid:199). It therefore seems like people in the twelfth century province Västergötland, “king, farmers and all residents, bishop and all clerics”<sup>8</sup> (ibid:7), were well organized. They were ruled by [various] kings, agreed on a common law, and part of the large Christian organization.

Bishops and kings obviously had connections with other regions. They were fore example involved in the founding of a Cistercian monastery in Varnhem, less than 15 km east of Skara in the 1150s, soon followed by a nunnery in nearby Gudhem (Edenheim & Rosell

1982; Rosborn & Schimanski 1995:26). A few written records also suggest that there were active contacts between Norway and Västergötland in the mid-twelfth century. One regards a ‘lawman’ who closed a treaty with the Norwegian king, concerning the border between Västergötland and Norway, in 1135, and two years later the same man intervened in a conflict [a battle which he lost], between two Norwegian kings (Rosborn & Schimanski 1995:24).

In addition to monastery, nunnery and cathedral, people in Västergötland raised a large number of small, local churches. The Older Västgöta law includes a count of over 500 local churches that existed in the province in the 1220s (Wiktorsson 2011b:173). A relatively large number of these have survived. The thesis’ study material, the five churches, are just a few out of many similar early masonry churches in the area. About 150 parish churches probably include remains from the twelfth- and thirteenth centuries, and 43 out of these comprise substantial parts of both nave and chancel (Gullbrandsson 2008b:23). However, no specific regional written evidence can support interpretations of this church building process in twelfth century Västergötland (e.g. Dahlberg 1998:71ff). Earlier studies have therefore worked mainly from physical materials, the remains of buildings, churches as well as houses.

Claesson (1989), inspired by research from other Swedish regions (e.g. Bonnier 1987; Liepe 1984), asks who it was that initiated and financed all the early local churches (Claesson 1989:8–11). He finds that the many small “Romanesque” masonry churches are not evenly distributed (ibid:130). Some areas have remarkably many, and the concentrations overlap areas were [later medieval] noble landowners dominated (ibid). He argues that private landowners were probably patrons in these areas, more likely than local farmers and/or the church itself (ibid:118, 126–130). Three of the five churches in the thesis, Forshem [Kinnekulle], Gökhem and Marka [Falbygden] are located in these areas with many churches.

Yet, landowners and clergy did perhaps not represent either the aristocracy or the Church, in local church building projects. Individuals in these groups were likely connected, through kinship, friendship and loyalty (cf. Hermanson 2004:61–99). Once financed, a church building project also involved other participants who interacted in selecting and forming the available building materials. They had to act as a team. Yet, patrons, clerics, master builders, masons, carpenters and artisans probably had varying degrees of freedom and opportunities to influence the result, during the process.

The mid-twelfth century churches in Västergötland were likely created in an oral culture. Even if they used drawings [e.g. on the ground or in sand or wood or wax], or worked from models, the team of patrons and builders communicated through speaking and listening. Glassie accounts for two modern examples of local mosques, one in Turkey and another in Pakistan, which were raised without drawings (Glassie 2000:249–252). First, a master builder was hired to do the job. Glassie finds that a few words were enough to agree on what to do, and no plan was drawn. What the master builders needed to know was the size of their budget (ibid). The masters then oriented and staked out the plan of the buildings on the ground. In Turkey the master was a carpenter, and he made the windows, door and roof, and the villagers raised the masonry walls themselves. In Pakistan the masters’ labourers dug up the soil and shaped it into adobe bricks (ibid:249ff). Glassie finds that the communications

between patrons and master builder does not need to be complex. He argues that the minimal planning suggests that the patron and master builder have the same idea about the design, construction, and its use (ibid:251f).

In any case, people in Västergötland clearly made heavy investments in new temples, and their intense activities stand out. Taking a Swedish viewpoint, Lindahl finds that the early churches in central parts of Västergötland forms a notable concentration (Lindahl 2008:11f). Lindahl gets “the impression of a concentrated building effort, a definitive manifestation of the victory of Christian faith”<sup>9</sup> (ibid:13), and he argues that there was an organized clergy in place at this time (ibid). The same movement, that is, large-scale church building undertakings in tandem with the development of the Catholic Church organization, is visible in many other parts of Scandinavia and northern Europe (Southern 1993; Moore 2000:55ff).

A local church was probably a busy place in the mid-twelfth century. Mass was performed a number of times every day, and collective ceremonies at holydays. It was about prayer, offering, confession, and feasts for saints, Christmas and Easter, baptizing and funerals. In connection with the rituals, people walked in processions, as they carried shrines with holy relics, or a deceased on a stretcher (e.g. Nilsson 2004:87–169; Moore 2000).

### **Wooden houses and churches**

People did of course not only build churches, they also raised houses for themselves and their animals, to live and work in, and in Västergötland these were built with wood. Myrdal points out, from a Swedish viewpoint, that more or less all houses and things were built and made with wood, the material culture was completely dominated by wood (Myrdal 2004:191f).

On the one hand there is a large stock of remains from twelfth century wooden houses in Västergötland, which have been excavated in the two towns Skara and Lödöse, and generally these town houses were timber-framed with earth-fast posts, and only about 4–5 m wide (Carlsson 2007; Carlsson och Ekre 1980; Sigsjö 1980). The walls were filled with either wooden boards in post-and-plank technique, or wattle and clay (Augustsson 1995:37). The small width, 4–5 m, allows for a rather simple roof, perhaps just rafter-couples attached to horizontal wall plates.

On the one hand there are only few examples of excavated farmhouses. This lack is critical to this study, as understandings about those houses would connect to the local churches. Augustsson suggests that the farmhouses and town houses were alike, but differed in scale (Augustsson 1995:37). He highlights as an example a long wooden building excavated in Råda, south of Lidköping (Augustsson 1995:35f; Vretemark & Jacobzon 1996:105–114). It was probably raised in the end of the eleventh, or in the beginning of the twelfth century (ibid). The house was 7–8 m wide and over 20 m long, and there were earth fast posts every couple of meters (Vretemark & Jacobzon 1996 109 fig 7 and 8). The width, the larger span, probably required a more complex and well thought-through roof construction. There were perhaps tiebeams, binders across that connected couples of posts and wall plates. This, in turn, would be attached to common rafters. In addition, there may have been sills between

the posts, which made the framed wall structure stiff. The house in Råda in Västergötland could be compared to four farmhouses in the neighbour province Halland (Streiffert 2005:132f). These are generally dated to the same period or a little earlier. The width vary between 5–7 m and up to 8.5 m wide (ibid). These houses have varying lengths, from 16, to 31 m (ibid). It seems like the width, the span the roof had to cross, even if based on very few examples, was more or less the same in Västergötland and Halland.

No standing wooden church in Västergötland has been dated to the twelfth century. To find such old standing wooden churches we have to visit stave churches in Norway, for example Urnes, Hopperstad and Kaupanger. However, there were likely many. Lagerlöf identifies almost 80 wooden churches that existed in Västergötland at some point during the medieval period, based on both excavations, later written sources and for example seventeenth century depictions (Lagerlöf 1985:10ff, Fig 2). Lagerlöf suggests that there were likely many more, and argues that the earliest local churches in Västergötland were wooden buildings (ibid). A number of excavations, which were carried out after Lagerlöf's overview, supports this and fill out the twelfth century picture.

The excavated remains of two small wooden churches, dated to the beginning of the eleventh century, shows rectangular floorplans. One is of a wooden structure [4x6 m] with corner earth-fast posts in Karleby (Vretemark 1998). Vretemark dates the Christian burials at the site to around the year 1000, and argues that the church was raised shortly after that (ibid). The remains of a similar small wooden church, also dated to the beginning of the eleventh century was excavated in Varnhem<sup>10</sup> (Axelsson & Vretemark 2013; Vretemark 2015:136).

These two small wooden buildings with earth-fast posts were soon to be replaced with larger structures on stone foundations. The first church in Varnhem was substituted with a larger in wood, only after some decades (Vretemark 2015:136), and the church in Karleby was replaced around the year 1100, with a new larger wooden structure [6x11 m] (Vretemark 1998).

The rebuilding in Varnhem continued, as the wooden walls were replaced by masonry towards the end of the eleventh century (Vretemark 2015:136f). A similar process was interpreted in Sunnerby (Nygqvist Thorsson & Nitenberg 2010:86–90). Here a small slightly rectangular wooden church or chapel [4x5.5 m], was probably in use only a relatively short period, from the end of the eleventh century until the mid-twelfth, when it was replaced with a new and larger masonry church (ibid).

People continued to build new, and larger wooden churches with earth fast posts into the twelfth century. A church with earth-fast corner posts was raised in Södra Råda<sup>11</sup>, probably in the mid- or late twelfth century (Wallebom & Edlund 2005:13). The corner posts shaped a rectangular nave, [4.5x6.5 m], and smaller square chancel. The remains of another church with earth-fast corner posts, was excavated in Säm (Theliander & Tollin 2010). The nave was rectangular [5.4x7.4 m], and the chancel smaller and square. The authors suggests that the building was raised in the beginning of the twelfth century (ibid:43).

The remains in the ground offer floorplans, sizes and complex layers. The interpretations show that people raised wooden churches with earth-fast posts from the beginning of the eleventh- until the mid-twelfth century. In tandem with this, from the middle and end of the eleventh century and on, the examples show alternatives to earth fast posts, a wooden structure on a stone foundation, as well as masonry.

Loose parts from three stave churches in Västergötland, Vänga, Hällestad and Kinnaromma, adds to this picture. The parts have survived because they were reused in floors. Today they are collected in the Swedish History Museum in Stockholm. The wood material is mainly oak and dendrochronology identifies the felling dates. The trees in Vänga were felled in the second half of the eleventh century [after 1059], and the other two in the first half or mid-twelfth century, Kinnaromma likely in the 1130s and Hällestad in the 1140s (Bråthen 1982). Thus the two latter were raised in the same period as the five churches in the thesis study material.

The surviving parts offer insights into constructions, openings and heights. Analyses and interpretations of the three stave churches have been included in a number of twentieth century works (Boëthius 1931; Eckhoff 1914–1916; Lagerlöf 1985; Lundberg 1940). Eckhoff, for example, documented the parts in detailed drawings. The wall-planks were put together standing side-by-side and fitted into a frame with a sill below and a wall plate above, which had grooves. There were special corner-posts (Lagerlöf 1985:59 [e.g. Kinnaromma Fig 54]). The reconstructions suggest rectangular nave floor plans. In Vänga and Hällestad the naves were between 6 and 7 m wide. Both were a little more than 4 m high (Lagerlöf 1985:31f, 114). Kinnaromma church probably had a similar, rectangular nave floorplan however, Lagerlöf finds it not possible to reconstruct safely (ibid:60). The chancels were smaller and lower with square floor plans.

There are traces from a few entrances. In Vänga, there was a door in the nave's southern wall [close to the southwest corner], a little less than 80 cm wide, and notably another, wider door 130 cm, in the middle of the west wall (Lagerlöf 1985:114). In Hällestad there are remains of an opening, 70 cm wide and 180 cm high however, it is not clear if this opening was to the nave or the chancel (ibid:126f).

The remains of three stave churches thereby fit descriptions of other medieval wooden stave [and later timber] churches. Lagerlöf finds these characterized by a larger, mostly rectangular nave, and a separated smaller chancel (Lagerlöf 1985:272). Further, Lagerlöf suggests that the entrances were generally located in the south wall of the nave, near the southwest corner (ibid:270). In addition, he claims that this was almost without exception the only entrance to the church, as entrance to the north side [of the nave], and/or to the chancel, occur but are rare (ibid).

The Older Västgöta law has a section for churches [*Kyrkobalken*] (Wiktorsson 2011b:6–21). This includes, among other things, a short part about church buildings (ibid:10f). In this, the lawmakers were concerned to clarify what needed to be intact in an aging church, in order to keep its consecration. They write in the original wording, “*Taker kyrkia at fyrnass - standae*

*stulpaer - liggia sillir - er helt dyrni - oc festiband - ligger kamber heller*” (ibid:10). In my interpretation to English this reads, “Starting the church to age - standing posts - lies sill - is intact doorwood - and attached to plate - lies ridge intact”. The lawmakers continue to state that if these parts of the church building are intact, then the church can keep its consecration (ibid). This concise description is important to the thesis, in particular as I find that it explains how the built wall structure meets the roof.

The wording “standing posts” most likely refers to a wooden construction. Both Lagerlöf (1985:11, 269) and Claesson (1989:29) interpret that it is a wooden [stave] church that was used as an example. Yet, Claesson points out that this is strange, as there were so many, hundreds of masonry churches in the province, when the law was written down (Claesson 1989:30). One explanation may be that the lawmakers were concerned in particular with aging churches. With the insights from recent excavations, it is quite possible that most old and aging churches in the early thirteenth century were in fact those wooden churches with posts, which had been raised a century or perhaps even two centuries earlier. The masonry churches were in comparison new, and as we now know many centuries later, they age slowly. Yet, if there was an aging church with masonry walls in the 1220s, all but “standing posts” and “lies sills” in the law, would have applied to that building too.

My interpretation of “*festiband*” is slightly different from Wiktorsson’s translation to Swedish<sup>12</sup> (Wiktorsson 2011b:11). Wiktorsson translates this “*fästhand*” (ibid), and explains [in note 9] that this refers to “översta bjälklagret”<sup>13</sup>. This refers to a system of horizontal joists or beams, and I interpret similarly, however; the word “*fästhand*” is in my view not well found. The word ‘band’ in “*festiband*” is important as it suggests a wall plate. In modern Swedish, a wall’s top horizontal plate is called “*väggband*” or “*hammarband*”. I argue that “*festiband*” then, translates into three words, “*fäst-i-band*”, i.e. attached to [wall] plate. Thus, the law explains how this important part, where wall and roof meet, was constructed. The order of words in the law text has a flow. They wrote first “standing posts”, and thereafter “lies sills”, as if the posts were put up first, and the sills were attached later, perhaps in between the posts. Then the writer climbed through the “intact doorwood”, and once inside they looked up to see the visible “[beams] attached to [wall-] plate”, and above these, “lies ridge” [the ridge purlin].

### **Masonry churches with timber-roofs**

If no standing wooden church has survived from the twelfth- and thirteenth century in Västergötland, there are by contrast many small local masonry churches. However, few of these are safely dated.

The local masonry churches have been explored since the beginning of the twentieth century, as Fischer (Fischer 1913; 1914; 1920; 1922) studied the masonry in local churches in Västergötland. His works were among the first within the national Swedish art historical inventory<sup>14</sup>. He finds that the earliest masonry churches in Västergötland have Romanesque



forms. He compared to European Romanesque churches, in order to establish the local churches development over time, and their distribution in the province. Dahlberg finds that Fischer's studies, which placed the regional architecture into the European Romanesque context, have been unquestioned since (Dahlberg 1998:342f). He argues that this is problematic, in part because so few parish churches in Västergötland show "distinguishable stylistic features" (ibid:343). Dahlberg emphasizes the hazards of stylistic dating (ibid).

Nevertheless, the idea of Romanesque style has influenced more or less all studies on early masonry churches in Västergötland (e.g. Claesson 1989; Dahlberg 1998; Runer 2006). Claesson finds that the masonry churches ".../ have largely preserved their original Romanesque appearance"<sup>15</sup> (Claesson 1989:46). Indeed, he points out four of the five churches, namely Forsby, Gamla Eriksberg, Gökhem and Marka, as particularly good examples of the Romanesque style (ibid:141). Dahlberg approaches the buildings from art historical insights, which he connects to archaeological and geographical interpretations (Dahlberg 1998:15). He discusses the Romanesque style [floorplans, type of masonry, decorations on walls, baptizing fonts and gravestones] in a large number of small local churches in an area surrounding the town Skara (ibid:21). Dahlberg suggests that the Romanesque breakthrough was a dynamic process in Västergötland, which was linked to social change in the region, and that the Romanesque forms helped manifest the Church' power (ibid:346f). However, Dahlberg underlines that even if the European Romanesque forms were brought to Västergötland in the first half of the twelfth century from outside the province, it is not possible to interpret if the influence originally came from the continent or England (ibid:182f). He also points out that the access to local stone material was important, and that there was likely a centre for skilled stonemasons in the quarries in the Kinnekulle area (ibid:346f). One of the five churches, Forshem, is located in this area, and a central part of Dahlberg's study. The three churches Forsby, Gökhem and Marka, are not part of his study, but located close to the area chosen by Dahlberg.

Questions about early churches Romanesque architecture has been analysed from a Swedish viewpoint. Working from a large Swedish material, Bonnier points out that a typical Romanesque twelfth century church has a rectangular nave and a smaller and lower chancel (Bonnier 2008:137). She finds that the masonry walls have relatively small, modest openings with round arches (ibid:141). Further, there were sometimes two entrances to the nave, from both south and north. West- entrances occurs however, in the law text has rare (ibid).

Inside, a Romanesque Catholic church interior had its obvious centre of attention at the high altar in the chancel (Bonnier 2008:158). A triumphal arch and crucifix marked that there was a difference between the chancel and the congregation's part [the nave] (ibid). In addition, almost all churches had smaller side altars by the nave's east wall, in the south and north corners (ibid:159), and excavations suggest that the baptizing font was placed in the centre of the nave or in its west part (ibid:160).

Bonnier finds that the rooms did generally not have vaults; they were timber-roofed (Bonnier 2008:141). A survey and catalogue by Gullbrandsson (2015) presents a number of

early roofs [fragments or complete] in churches in Västergötland, and the five churches' roofs are part of this. Some Swedish roofs have decorative parts (e.g. Thelin & Linscott 2008:124), and the roofs in two of the five churches, Forshem and Gökhem, have such.

The five roofs, as well as other early roofs in Västergötland, and in other parts of Sweden, are largely of the common-tiebeam form. In fact, most of the earliest surviving roofs in north-west Europe and Scandinavia are of this same type (Courteney & Alcock 2015). Courteney & Alcock brings together a number of regional studies and surveys from north-west Europe and Scandinavia (ibid:137). They find about 250 common-tiebeam roofs in total (ibid:163), and remarkably, a large part of these, about 130, occur in Sweden (ibid:137).

The research on medieval roofs mainly focus the trusses, i.e. their shapes, spacing, typology and structural development over time. This has been explored in west Europe (e.g. Ahrens 2001 [1981]; Binding 1991; Epaud 2003, 2007, 2011; Hoffsummer 2002, 2009, 2011), in Scandinavia (e.g. Madsen 2003, 2007; Storsletten 2002) as well as in Sweden (e.g. Gullbrandsson 2011, 2013, 2015; Linscott 2007; Thelin & Linscott 2008; Olofsson & Holm 2013). In a common-tiebeam roof, each truss has a tiebeam at the base, and all the trusses in one roof are largely alike. This contrasts later roofs, which often include a hierarchy of principal- and common-rafter trusses with collars. In addition, a relatively low pitch, lack of longitudinal stabilization, and joinery with lap joints characterize most early common-tiebeam roofs (Courteney & Alcock 2015:125). Structure-mechanical aspects of common-tiebeam roofs have been analysed (e.g. Thelin 2006). The structures creates both vertical and horizontal forces, and the tiebeams provide support for the horizontal thrust (Thelin 2006; Thelin & Linscott 2008:121–128). In Sweden, the trusses were often placed at a relatively close distance, and the tiebeams were connected to a wall plate placed at the outside of the masonry wall (ibid). The tiebeam is commonly embedded into the masonry on top of the walls (ibid [fig 4, 7, 12]), which provides good possibilities for transferring horizontal forces (ibid). If the tiebeam is cut off, the structure becomes dependent on outer support, for example provided by the walls, to avoid deformation (ibid). Some roofs have ridge-beams, a longitudinal beam that connects the roof trusses at the ridge (ibid). Other studies that have focused the craftsmanship, the carpentry, the processes of construction techniques and joinery find that the carpenters who made the roofs worked with similar tools and were skilled (e.g. Sjömar 1988, 1992, 1995; Storsletten 2002:378f).

Surveys of wooden roof structures opens for dendrochronological dating (e.g. Alcock & Miles 2013; Seim et al. 2015), and non- or less-destructive sampling have been developed (e.g. Olstad & Stornes 2014). The analyses can thus be based on scientific dating. Instead of the time-perspective 'early medieval-Romanesque' [vaguely interpreted eleventh- mid-thirteenth century], it is possible to focus on precise dates.

Finally, Lindahl puts forth that the early church architecture [in Sweden] is now well known (Lindahl 2008:13f). He suggests that the architecture represents a set of forms, which were fully completed in advance, and that the proportions given to naves and chancels were based on pre-determined guidelines (ibid). Lindahl includes the visible timber-roofs in the idea of pre-completed church architecture, as visible timber-roofs occur also in European

churches (ibid). Lindahl finds that this architecture is most often called Romanesque, however, he argues that it could just as well be named classic (ibid).

Now, scholars have framed their understandings of the early churches in Västergötland with the notion Romanesque for more than a century. As a result, professionals likewise use the notion Romanesque, both the style and the period, in heritage assessments. One example is Forsby church, as the Swedish National Heritage board identifies the church as a “well-preserved representative of the medieval, Romanesque aps-church”<sup>16</sup> (RAÄ Forsby).

## 1.2. THE PAN-EUROPEAN ROMANESQUE

My question in this sub-chapter is about the European stylistic framework Romanesque. How does this idea connect to the thesis search for architecture, for example questions about how people may have discovered, approached, entered, moved and explored the built environment? The interest here focus the Romanesque as a figure of thought.

The masonry buildings that have survived from the eleventh- and mid-twelfth century in different regions in Europe are essentially churches or monasteries. Thus, the buildings were indeed at the same time regional and part of a European Church movement. Their architecture is largely interpreted Romanesque style. This, both viewed as style and period, is well known, and the literature on Romanesque architecture is extensive (e.g. Barral 2001[1998]; Fernie 2014; Stalley 1999:191-235; Toman 2000[1995]). My interpretations here builds largely on one of these, the wide-ranging chronological survey ‘Romanesque Architecture’, written by the architectural historian Eric Fernie (2014)<sup>17</sup>.

Fernie finds that the buildings can be identified Romanesque style. He argues that, by the eleventh century, the characteristics of masonry buildings “had become so pervasive that the approach can be considered one of the main habits of mind of the society responsible for it” (Fernie 2014:5). Stalley has a similar view; he finds that Romanesque techniques were adopted in “virtually every country of Europe” by the twelfth century (Stalley 1999:205).

This habit of minds was first called Romanesque in the beginning of the nineteenth century by a writer, William Gunn<sup>18</sup>, who related the style to Latin-based languages (Fernie 2014:5). As in these languages, Gunn interpreted that the buildings included architectural mistakes, (ibid). Thereafter the idea of Romanesque architectural style, identified by the thought “Roman but not properly so” (ibid [Gunn 1813, cited by Fernie]), framed understandings of early medieval masonry buildings until the early twentieth century. In the second half of the nineteenth century there was a shift, as it was accepted that buildings from the eleventh- and twelfth centuries should be considered a distinct style and period in its own right (ibid)<sup>19</sup>.

Fernie finds that surviving eleventh- to mid-twelfth century masonry buildings in various regions in Europe have certain forms and features in common. Characteristically, the various parts in a Romanesque building complex make up a whole, they relate to each other, the “exterior represents the volumes of the interior” (Fernie 2014:5). Stalley suggests something of the same, as he finds that the most important aspect of Romanesque aesthetics was the

[new] way individual parts of a building was subordinated to a whole (Stalley 1999:194). Romanesque decorative articulations were not all new [in the eleventh- and twelfth centuries], but Stalley argues that it was new that they were combined (ibid:191). Examples from the different European regions are characteristically large, aisled churches with transepts and articulated east ends (cf. Fernie 2014:24; O’Keefe 2007:16). These churches’ interiors were either timber-roofed or vaulted (Fernie 2014:24). The structures had rounded arches, vaults and arcades (e.g. Fernie 2014:24; Barral 2001:46ff). The solid walls with large surfaces were important (e.g. O’Keefe 2017:16)<sup>20</sup>. This contrasts for example a [Gothic] church of the thirteenth century, where the walls were more transparent (cf. ibid).

The stylistic analyses focus attention on the buildings for example, how walls and volumes divide into bays with pilasters, half-shafts and buttresses. The varying stylistic articulations in different regions or countries are compared, and studies bring up themes [town/country or cathedrals/monasteries], as well as developments over time [when the style became, developed in phases, or transformed into the next period, Gothic] (e.g. Barral 2001[1998]; Fernie 2014; Stalley 1999:213–232; Toman 2000[1995]). Another focus of attention is how the Romanesque architecture connects to religious symbols, for example, the idea of heavenly Jerusalem (e.g. Toman 2000:7–15), or divine light, reflected in golden and coloured surfaces in the churches (cf. Kollansrud 2016)<sup>21</sup>, or holy objects, like relics (ibid). The interpretations of religious symbols relates to well known clerics written down thoughts and ideas, offered in twelfth century sources (e.g. Sicardus 2008).

One problem with the Romanesque, viewed as a framework, is that the stylistic articulations vary so greatly. Stalley finds that so much variation exists between different regions “that it is easy to despair of finding any consistency” (Stalley 1999:211). Piltz suggests, from a Swedish perspective, that because the various manifestations of Romanesque style in Europe differ, the thought of one coherent Romanesque style is partly misleading (Piltz 1995:7). He argues that the style instead includes “Roman, Early Christian and Byzantine form elements [which] merged with the newly Christened peoples’ own traditions”<sup>22</sup> (ibid). Stalley finds similarly that there was a flow of designs. He argues that for example the Cistercians [who spoke for a simple and utilitarian architecture], may have brought European ideas to various remote regions, and that Cistercian architecture was combined with local techniques (Stalley 1999:180). Examples in Sweden are the monasteries Alvastra and Nydala (ibid).

In addition to the many variations within the Romanesque style, another problem is that people raised buildings in other styles, in tandem with the Romanesque. Cornell, Rosén & Öbrink point out that a number of other valid styles, such as Early Christian or Gothic, co-existed in different regions with the various forms of Romanesque buildings (Cornell, Rosén & Öbrink 2015:5). They argue that the “basilica type churches were built in Rome in the twelfth century [Lucherini 2013] when Abbott Suger worked on his church in Saint Denis [Panofsky 1946]” (ibid). In fact, in Rome, the heart the Catholic Church domain, Fernie cannot find any church, which “can be convincingly classified as a Romanesque building” (Fernie 2014:94)<sup>23</sup>.

There are also difficulties defining the period. It is disputed when the Romanesque style began (Ferne 2014:7). Fernie argues that it started when its first characteristics became evident in the Carolingian period (ibid:7f) and that it thereafter developed into becoming the dominant style during the following centuries (ibid). However, for example Barral finds that a distinct Pre-Romanesque style can be identified between the Carolingian and the Romanesque periods (Barral 2001:13). Fernie divides the Romanesque period into three loosely applied chronological sections, c. 800- c.1000, c.1000- c. 1150, c. 1150- c. 1300, viewed as early, middle and late phases of the style (ibid:29). He argues that “in the middle phase it [the Romanesque] is the overriding choice in the great majority of the areas of the Latin Church; and in the late phase it is /.../ in competition /.../ with the Gothic” (Ferne 2014:29). The end of the period is also disputed. The issues are about precisely when, where and how did, or did not, patrons, master builders and masons abandon the Romanesque and instead develop the Gothic (e.g. Barral 2001:227).

Richly decorated Romanesque masonry buildings are few in all of Scandinavia (Ferne 2014:194f). From the European outlook, the west Swedish region Västergötland is in the margin of the Romanesque domain. There is little decoration and it is difficult to date the churches stylistically (Dahlberg 1998:342f). Dahlberg divides the church building activities in the region Västergötland in two partly overlapping phases, the first c.1000–1130, arguing that the period is “contemporary with pre-Romanesque forms”, and the second c.1100–1300, as this period includes “both the international Romanesque breakthrough and the transformation to the Gothic forms” (ibid). However, there may have been some overlap between the Romanesque and Gothic forms. Nilsson claims, in a study about medieval churches in the neighbouring region Halland, that even if the two styles [Romanesque and Gothic] clarifies both general stylistic differences and separates the time periods (Nilsson 2009:303), the two styles likely have overlapped somewhat (ibid:144f).

The five churches would, on the one hand be situated safely within the Romanesque period, as their roofs are dated 1130–1160. They find themselves in the very end of the middle or in the beginning of the late phases, which were suggested by Fernie (2014:29), i.e. between being the choice of the great majority, and in competition with the Gothic style (ibid). Dahlberg places them in the beginning of a second stylistic phase c. 1100–1300, in line with the “international Romanesque breakthrough” (Dahlberg 1998:342f).

Ferne puts forth that the concept Romanesque style has been criticized because the stylistic definition is vague and imprecise (Ferne 2014:8). However, he finds that the variations are resulting from individual choices, and that styles can be viewed as “common characteristics of a large number of instances” (ibid). Thus, he argues, “seen in these terms, [Romanesque style] /.../ can be used as an approach to understand the past” (ibid). Fernie suggests to identify common factors within the various stylistic articulations and to “present the phenomenon both as a whole and in its many varied forms” (Ferne 2014:9). Stalley suggests that the Romanesque style could be thought of “in terms of a language, utilized by local masons according to their own traditions and aesthetic choices” (Stalley 1999:211). However,

O’Keeffe finds the notion Romanesque “stretched across vast quantities and great diversities of material” (O’Keeffe 2007:26–29), and takes the critique further, arguing that the style is [not just] vaguely defined, it is also stereotype (ibid:107). O’Keeffe calls for new ideas and different perspectives to moderate the image (ibid).

### 1.3. GOING BEYOND STYLE

The five naves could probably be interpreted Romanesque to some degree, even if the style is vaguely defined, and little in the buildings is clearly ‘Romanesque’. Likewise, the naves’ twelfth century architecture probably related to religious symbols, which could be further interpreted with text analyses. However, in this work I search for architecture in archaeological remains. Therefore, I leave questions about the symbolic sacred parts and objects, stylistic diffusion, or how one style was transformed into another. Instead, I follow O’Keeffe’s call for an open mind, new ideas and different perspectives. The questions here are about how architecture housed people and things in the archaeological past.

The chosen five churches include both twelfth century walls, sometimes with original openings, as well as attics with roofs in wood. However, their earliest appearance is not immediately available for interpretation. The old walls are hidden behind newer surfaces, and even in the relatively well-preserved attics it is not always evident what parts belong to the mid- twelfth century, and what is later additions or changes. Thus, this sub-chapter highlights examples of studies working from buildings’ archaeology.

#### **Detail and whole in buildings archaeology**

In the investigation of the Hellenistic temple in Xantos, Turkey (Hansen & Le Roy 2012)<sup>24</sup> the architect Erik Hansen and the archaeologist Christian Le Roy succeeded to puzzle a large pile of stones together into a complete 3D reconstruct of the original building’s form and technology. The study also explores the chronological changes from first a Lykian, to later the Hellenistic temple. Even the latter’s destruction is included, as they analyse how the stones ended up in a particular pile (ibid). In this work, Hansen and Le Roy combined their understandings of Greek architecture, with analytical recording. This kind of work is, in my view, core in buildings archaeology.

The same approach is useful in analyses of wooden buildings. Buildings archaeology in medieval wooden structures has developed in tandem with dendrochronology during the last two or three decades. Berg’s work on ‘Norwegian log buildings from the Middle Ages’ (Berg 1989–1998) and Sjömar’s thesis (1988) on Swedish wooden medieval buildings, and building practices, are perhaps the most extensive examples in Scandinavia. Epaud (2007), analyses dated medieval timber framed structures in Normandy, France. Alcock & Miles (2013) date and explore medieval cruck constructions in Midland England. All these studies compile numerous recordings of wooden houses.

The studies in buildings archaeology focus attention on how a building's parts are prepared, formed, and put together. There is a focus on relations between detail and whole. Dendrochronological dating employed in an increasing number of studies will probably move the field. The scientific dating of wooden structures help steer away from stylistic relative chronologies, also of masonry, if combined. The focus on detail reveals that buildings are not permanent they change.

### **Understanding people through buildings<sup>25</sup>**

Green & Dixon find in a UK survey that there has been a shift in both approach and analysis in research on standing historical buildings, in the last ten years (Green & Dixon 2016). They argue that newer studies are about “understanding people through buildings”, as opposed to earlier, which aimed to understand buildings within certain social contexts (ibid:123). In addition, in newer studies, standing buildings often form only one part of the records, as they are combined with for example excavations, documentary records and landscape analyses (ibid). Green & Dixon see in this a broadening of what buildings archaeology can do (ibid:123ff, 128).

One relatively new approach focus attention on building practices. These works emphasise the activity to build, “what builders do” (Ingolds 2013:47), and a number of recent Scandinavian studies explore medieval building processes. Jensenius (2001) explores the planning and designing of excavated eleventh century wooden churches in Norway (ibid:Vf). Jensenius finds similarities in proportions between different church buildings. He argues that the builders may have repeated the practices staking out a new building (ibid).

Medieval building practices were traditions; however, these are since long, forgotten. Almevik & Melin (2015) aim to develop new understandings of medieval wooden building practises through practical experiments. Their case is the reconstruction of a fourteenth century church in Södra Råda, in west Sweden (Almevik & Melin 2015:72). Almevik & Melin underlines that their study is “practice-led” and that carpenters participate as “research agents” (ibid:76). They base their analyses on traces, in combination with “self-observation *in action* and self- and participatory observation *over action*” (ibid:76). Importantly, the experimenting depends on the ability to perform the procedures skilfully (ibid:99). Almevik & Melin propose that the design of the medieval building was partly “conceived in the process of making” (ibid:77) and argue that architecture and carpentry was “fully integrated” (ibid:85).

Once a built structure was standing, people used it, they entered and moved around inside. Eriksson (2005) points out that earlier studies rarely embrace volumes (Eriksson 2005:11f). She finds that these studies “deconstruct /.../ the building /.../ prioritizing the details in the materials and therefore provides /... / a simplistic picture of the spatial reconstruction”<sup>26</sup> (ibid:16). She argues that 3D documentation provides a base for new interpretations, as it gives evidence to “how they [the rooms] were meant to be experienced and used

at different times"<sup>27</sup> (ibid:11). Eriksdotter approaches her case building from different angles and presents three “methods for reading a building /.../ [through the] concepts of time, space and use” (ibid:333f). Further, she argues, these need to be employed in a certain order; 1) analysing measurable physical traces and characteristics, 2) analysing spaces i.e. (a) measurable properties or volumes and (b) non-measurable characteristics such as meaning, and finally 3) analysing the use (ibid:19).

Eriksdotter interprets the building’s different phases, working from physical traces [from construction, repair and rebuilding], using a stratigraphic method (Eriksdotter 2005:335f). Thereafter, these were combined with 3D spaces<sup>28</sup>, by means of a computer-based model of the present building, and different hypotheses were tested (ibid:13, 338). Eriksdotter finds that the “cloister [building] underwent a much more complex course in the Middle Ages than suggested by previous two-dimensional reconstructions” (ibid:338). In a simulated walk, a “sequence of experience /.../ with different actors” (ibid:339f), she the researcher, re-experienced in virtual reality (ibid:334) “how different bygone users might have reacted in different spatial positions” (ibid:340). Markers such as, boundaries, doors, windows, light and sound are viewed as signals which help interpret “how a bygone user experienced different spatial settings” (ibid). The experiment is used as a [visual] “check” (ibid:343).

#### 1.4. A CENTURY WITH CHURCH RESTORATION<sup>29</sup>

The five churches were all objects of extensive restoration projects during the twentieth century. These created the characters that the buildings still largely have. The five churches are not alone in this; many other early churches were also restored, in Västergötland as well as in other parts of Sweden. This sub-chapter seeks to sketch a background to the present situation in the five naves, the materials and constructions that I investigated in the years 2012–2015. I ask about the many parish church restorations in Sweden during the twentieth century. The numbers, on what grounds, by whom, how, and when?

Parish church buildings and artefacts attracted attention during the twentieth century as part of a national Swedish cultural heritage. Valuable movable objects were collected in museums. The medieval baptismal font from Forshem church, the reliquary from Eriksberg, and the crucifix from Forsby are examples from the five churches; these objects are now in the Swedish History Museum in Stockholm. The church buildings on the other hand could not be moved to museums, they were instead restored. Oddly, they precisely therefore have been included in situations and projects involving a number of alterations and in some cases extensive changes.

In some rare cases, change has been slow. For example, the old church in Sunk, in Västergötland. This church was abandoned for a new in the very end of the nineteenth century. The building has since it became redundant been taken care of by ‘The Royal Swedish Academy of Letters, History and Antiquities’ [*Vitterhetsakademien*], and later by ‘The Swedish National Heritage Board’ [RAÄ]. Since 2015, it is in the care of ‘The National Property Board of Sweden’ [*Statens Fastighetsverk*]. The original masonry and tie beam





**Fig. 1.2.** Pictures from before restorations of **above left** Gökhem church from southeast and **above right** from northeast. Photo 1893 Welin, ATA. **Below left** Marka church. Photo 1911 Roland, ATA. **Below right** Forsby church from northeast. Photo 1913 Roland, ATA.

trusses from the twelfth century were still in place and the interior was mainly from the eighteenth century. The structure and interior has been basically maintained but it has not been thoroughly restored. Electricity and heating are not installed. The church is in spite of this still used at a limited scale. The parish has occasional services for example baptizing ceremonies there, and the church is open to visitors in the summer. It can be debated if the amount of maintenance was enough or correct. However, doing only limited maintenance for a century or two has in this case proved possible and favourable. The church and cemetery is now viewed a unique part of the Swedish national cultural heritage (RAÄ Suntak)<sup>30</sup>.

### Many projects and few architects

Most parish churches in Sweden have instead been the objects of restoration. A large number of projects were carried out, and a particularly intense period was in the 1920s–1930s when over 500 parish churches were restored, and the numbers peaked again in the 1950s (Bedoire 2013:249, 314; Åman 2008:333 [fig. 181, p334]). Of course, every restoration project had individual motives. However, there were also common aims. Bedoire finds that a priority in the intense 1930s was to get rid of the most recent additions, which were considered incorrect or even abusive (Bedoire 2013:275; cf. Gullbrandsson 2008:42). The intention was both to recover a “tradition-rich”<sup>31</sup> (Bedoire 2013:275) church, and to incorporate the churches into the national heritage (Åman 2008:337). Åman gives this nuance, underlining that it was not so much the nation, as the homeland, that mattered (ibid). Gullbrandsson provides an example with the church in Alingsås, in west Sweden (Gullbrandsson 2008:43). The argument for a proposed restoration project in 1930 was to “restore the church to its former atmosphere and dignity”<sup>32</sup> (ibid). Bedoire finds for example that the parish churches were not only restored to provide the local congregations with historical atmosphere, the projects also customized the churches for visitors from elsewhere (Bedoire 2013:273). The restored ‘parish church national heritage’ attracted tourists, Bedoire finds that the biking trails recommended by the [Swedish] Tourist Association, were consistent with the locations of restored, “corrected folk-churches”<sup>33</sup> (ibid). However, Bedoir points out, it was rarely written in a guidebook that a building was restored (ibid).

Bedoire finds a shift in the approach in the 1950s and 1960s, as architects designed altered interiors, for new forms of rituals and ceremonies (2013:314ff). The restoration projects were often argued to be necessary. The architect Porne for example, who was in favour of a restoration project on Gotland in 1955, claimed that, “as the situation is now, one has to choose between either to make a restoration, which will be very expensive, or to let the church fall into ruin. There is no other alternative”<sup>34</sup> (cited in Bedoire 2013:314f). Two distinctly different views on church restoration were formed later in the 1960s, one side arguing for change, in favour of a new church liturgy, and the other side was concerned with the buildings (Bedoire 2013:317). Architecture historian Göran Lindahl declared in 1968, “what is needed is a thoughtful maintenance technique, not a continuation in all eternity of taste-restoration”<sup>35</sup> (cited in Bedoire 2013:317).

Specialized architects and antiquarians, learned in art history, were in charge of the parish church restorations. This was a relatively small group, most were students of the professors in architectural history Sigurd Curman<sup>36</sup> and his successor Erik Lundberg<sup>37</sup>. Counting Curman's and Lundberg's students [those mentioned by Bedoire] collects 14 individuals, all men. Two of Curmans students, the architects Erik Fant and Axel Forssén were perhaps the most productive (Bedoire 2013:250; Gullbrandsson 2008:35). Erik Fant was in charge of 86 and Axel Forsén 97 church restoration projects (Åman 2008:334). Fant and Forsén were classmates at the architect school [Kungliga Tekniska Högskolan] in Stockholm, and both obtained their architect degrees in 1912 (Gullbrandsson 2008:35). They were then in their 20s. Fant worked all over Sweden (Åman 2008:336). Forssén, based in Gothenburg, was during his career involved in a large number of restoration projects in west Sweden,

mostly in Västergötland (Gullbrandsson 2008:35ff). Similarly, one of Lundberg's students, architect Jerk Alton conducted as many projects, starting in the 1970s (Bedoire 2013:318). Sigurd Curman was not in charge of any new projects after 1923 (Åman 2008:329), however his successor Erik Lundberg, was himself responsible for 42 church restorations (ibid:334), especially during the 1950s and 1960s, "he often had seven to eight church restorations going on simultaneously"<sup>38</sup> (Bedoire 2013:297).

### **What happened to the buildings?**

So what has survived from the early medieval period? There were different views on how to go about with various older and newer parts in a project. Professionals and scholars had long disputed over whether it is best to improve the historical whole with modern designs and [re] constructions, or if it is better to maintain the old building and all, or some of, the different parts in the current, aging state (e.g. Bedoire 2013:12ff). The two professors, Curman's and Lundberg's views on church restoration are significant, because so many projects were carried out by themselves or their students. Their views and approaches have been analysed in a number of studies (e.g. Bedoire 2013; Edman 1999; Gullbrandsson 2008; Åman 2008:329).

Curman argued for a cautious approach. He proposed already in 1903 to "maintain and repair carefully, bring out what might be hidden but let the rest of the building be alone"<sup>39</sup> (cited in Edenheim & Rosell 1982:128). His idea was thus to strive for the authentic, to accept remains that were only fragments and to let remains from different historical periods remain in place next to each other (Åman 2008:329). In practice, he chose to enhance parts from the medieval period and through the eighteenth century (Edenheim & Rosell 1982:128; cf. Jonsson 2000:146).

An important example in Västergötland is Curman's restoration of the church in Varnhem. Curman was in charge of the restoration project for five years, 1918–1923 (Bedoire 2013:244f; Edenheim & Rosell 1982). The relatively large church, a ruined Cistercian abbey, had been turned into a parish church in the seventeenth century. At this time, the roof and vaults over the nave, as well as the chancel with chapels around, had collapsed. In the 1660s, new buttresses and a mid-tower was added to the exterior, and a new altarpiece, pulpit, benches and an organ were put up in the interior (Bedoire 2013:21). Curman's student architect Forssén assisted him, and together they prepared a large number of recordings and drawings for the project (Edenheim & Rosell 1982:121–130). They kept the main structures. These were only partly from the mid-twelfth century. They also kept the interior from the seventeenth century (ibid; cf. Bedoire 2013:246). However, the foundations were reinforced with concrete, and the floor inside was lowered to what they assumed was the early medieval level, based on traces. Bedoire finds that surfaces' character were important to Curman (Bedoire 2013:235). Perhaps, accordingly, Curman had the exterior plaster [from the 1660s] removed so that the masonry [partly medieval and part rebuilt in 1660s] was left visible. In addition, this allowed Curman to make different building phases and a few previously hidden medieval openings, visible (Edenheim & Rosell 1982:128). In the interior

a new, tinted, thin plaster was applied to both old and new surfaces, a treatment that was '1920s' and probably alien to both the medieval period and the 1660s (ibid:130).

Lundberg on the other hand focused more on the medieval period and its relation to modern architectural articulation [as in 1950s and 1960s] (e.g. Bedoire 2013:298). He emphasized that it was important to allow for [his own] artistic creativity. The architect should, according to Lundberg, with innovative imagination "allow the old to resound in the modern contemporary whole"<sup>40</sup> (cited in Bedoire 2013:298). To Lundberg it was thus important not to imitate the old.

A restoration conducted by Lundberg in 1962–1963, in Västergötland not far from Varnhem, in Götene parish church, is characteristic for his approach. The small, twelfth century church had of course been changed throughout history, but not been 'restored' earlier. In his project, Lundberg kept the main building structures, the nave and chancel including the preserved wooden twelfth century tiebeam roof in the attic. However, he had both the late medieval sacristy and porch [*vapenhuset*] taken down. The inside and outside walls were stripped from old layers and plastered anew, except for parts with medieval decorative paintings. Everything that had been put in after the medieval period in the interior was removed and replaced, for example benches, and new benches were designed by Lundberg (Bedoire 2013:299). This means that walls and vaults, as well as the roof structure in the attic, remain from the twelfth century and later medieval period. However, almost everything one can see and touch is from the 1960s.

Curman and Lundberg opened up for new approaches in their time. Both considered old buildings important and made detailed investigations prior to the projects. They agreed [in writing] to change as little as possible and keep layers from diverse periods (Bedoire 2013:218), yet, as the examples here show, not necessarily all layers. They argued that new additions should be made with contemporary modern design (ibid:236) and new and old should be separated within an artistic whole (ibid:219f). These views and understandings were, seemingly without hesitation, carried out directly in the old buildings, the historical document itself.

Summing up. The parish church restoration projects in the mid-twentieth century [c. 1920s–1950s] were numerous and relatively extensive. A small number of individuals, architects and antiquarians, learned in art history and trained by two teachers [one teacher trained by the other], fitted the large number of churches into a similar national heritage costume. They were a group of men with common experiences that knew each other well. Particularly important to the thesis are the projects conducted by two students of Curman (Bedoire 2013:275), Axel Forséen [in Forsby 1933] and Årland Noréen [in Marka 1944 and Gökhem 1946].

The national costume was more or less tailored to their view of the European Romanesque style. The buildings lost some of their local diversity in this process. Looking back, Åman finds that this was a rebuilding phase not unlike others, throughout the churches long history (Åman 2008:340). This last restoration- or rebuilding phase still have a large impact. Fortunately, in spite of the fact that medieval roofs were identified in some parish

churches (e.g. Curman 1937; Lundberg 1940, 1971)<sup>41</sup>, many roofs and attics were left almost untouched. Thus, today, these offer a unique archaeological study material.

From the 1970s and onward, few extensive church restoration projects have been performed, and architects no longer dominate (Åman 2008:337). The aim since, is instead to preserve the buildings, and antiquarians and engineers have been in charge (ibid). However, what is proper maintenance? Four of the five churches [all but Forshem] were for example subjected to extensive exterior ‘maintenance’ in the late 1970s and 1980s. In these projects, more or less all outside plaster, older as well as newer layers, was removed with powerful machine tools.

Åman puts forth that the new more careful approach connects to historical building practices<sup>42</sup>, and that this helps preserve the buildings on their own terms (Åman 2008:340). Accordingly, specialized masons, carpenters and conservators, who work with traditional methods, are increasingly visible in accounts from parish church preservation projects, in tandem with antiquarians, engineers and historians (e.g. Göransson 2016; Planke 2016:117–135).

## Notes chapter one

- 1 The inventory started in 1912 by art historian and antiquarian Sigurd Curman [1879–1966] and art historian Johnny Roosval [1879–1965].
- 2 My translation from Swedish, "Sockenkyrko projektet".
- 3 The survey covered church buildings as well as cemeteries, religious objects, and heritagization processes.
- 4 My translation from Swedish: Fysisk förvaltning, betydelseförskjutning och kulturarvisering, kyrkan som konstnärligt och kulturhistoriskt objekt samt kyrka och liturgiskt bruk i förfluten tid.
- 5 In the medieval period, these areas belonged respectively to Norway and Denmark.
- 6 My translation from Swedish.
- 7 The copy is collected in the National Library of Sweden in Stockholm.
- 8 My translation from Swedish: "kung, bönder och alla bofasta, biskop och alla boklärdade män".
- 9 My translation from Swedish: "Man får intrycket av en koncentrerad byggnadsinsats, en slutgiltig manifestation av den kristna trons seger".
- 10 The location is next to the Cistercian monastery, on the top of a hill.
- 11 The site is located in the region Värmland, just north of the border to Västergötland, though within Skara Diocese.
- 12 "Börjar kyrkan åldras, står stolpar, ligger syllar, är helt dörrträ och fästhand [not 9, = översta bjälklagret.], ligger takås hel".
- 13 However, the word "bjälklagret", is not the proper word in Swedish, it should be "bjälklager".
- 14 Sveriges kyrkor. Konsthistoriskt inventarium.
- 15 My translation from Swedish, " /.../ har i hög grad bevarat sitt ursprungliga romanska utseende."
- 16 My translation from Swedish, "Kyrkan är en välbevarad representant för den medeltida, romanska absidkyrkan."
- 17 I thank Nat Alcock and Lynn Courteney for introducing me to this book.
- 18 William Gunn 1750–1841.
- 19 In addition to interpretations of the architecture, other fields have interpreted Romanesque style in for example, paintings, sculptures and artefacts.
- 20 O'Keefe finds Cluny in Burgundy, in particular Cluny III [built 1088-1130], a good example of Romanesque architecture among many others e.g. San Miniato, Santiago de Compostella, Speyer and Durham [I have chosen examples from different regions] (O'Keefe:2007:16–23).
- 21 I thank Charlotta Hanner Nordstrand for this reference.
- 22 My translation from Swedish, " /.../ antika, fornkristna och bysantinska formelement smälte samman med de nykristnade folkens egna traditioner."
- 23 Fernie argues that this was a calculated choice, not due to lack of imagination or funds (Fernie 2014:94). Fernie argues that "the very rejection by the popes of the phenomenon now called Romanesque can be read as a powerful indication of its existence for them as a visual formula" (ibid:9).
- 24 I was myself involved in this fieldwork, as Hansen's assistant in 1980.
- 25 The heading cites Green & Dixon 2016:123.
- 26 My translation from Swedish, "dekonstruerar /.../ byggnadens struktur till förmån för detaljerna i dess materia och ger därför /.../ en alltför förenklad bild av den rumsliga uppbyggnaden".
- 27 My translation from Swedish, "hur de varit tänkta att upplevas och brukas under olika tider".
- 28 Eriksdotter points out that a volume may be distinguished from the subjective space where an individual's or group's experience and assessment of a space fill it with meaning (Eriksdotter 2005:18).

- 29 The notion, conservation (UK) and restoration (US), is used in many different contexts and with different understandings. In Swedish, the word 'restaurering' means broadly, to "change a building" (SAOB). In this notion could be included; re-building, renewing, renovation, reconstruct or maintain (cf. Bedoire 2013:15). I use the word 'restoration' here and mean to change a building.
- 30 Suntak old church "represents a well preserved exponent for the Romanesque parish church type". My translation from Swedish, "utgör en välbevarad exponent för den romanska sockenkyrkotypen".
- 31 My translation from Swedish, "traditionsrik".
- 32 My translation from Swedish, "återge kyrkan dess forna stämning och värdighet".
- 33 My translation from Swedish, "tillrättalagda folkkyrkor".
- 34 My translation from Swedish, "Såsom situationen nu är har man att välja mellan att antingen göra en restaurering, som kommer att ställa sig mycket dyrbar, eller att låta kyrkan förfalla till ruin. Något annat alternativ torde inte finnas".
- 35 My translation from Swedish, "Vad som behövs är en genomtänkt underhållsteknik, inte ett fortsättande i all evinnerlighet av smakrestaurering".
- 36 Curman [1879–1966]. Art historian and antiquarian, PhD in 1912, professor in architectural history at the Academy of arts in 1912 (Bedoire 2013:228; cf. Åman 2008:329).
- 37 Lundberg 1895–1969. Art historian, antiquarian and architect, PhD in 1935, professor in architectural history at the Academy of arts in 1946. Students of Lundberg e.g. Jerk Alton and Åke Porne (Bedoire 2013:318ff).
- 38 My translation from Swedish, "ofta hade han sju till åtta kyrkorestaureringar på gång samtidigt".
- 39 My translation from Swedish, "Underhåll och reparera omsorgsfullt, framlocka vad som till även tyrs finns dolt men låt för övrigt byggnaden vara ifred".
- 40 My translation from Swedish, "låta det gamla få klinga i en helhet som var samtidens".
- 41 Curman wrote about the tie beam trusses in Kumlaby church at Visingsö (1937) and Lundberg wrote about a number of tie beam roofs in Västergötland (1940, 1971). In the restoration of one church, Forserum in Småland, Lundberg chose to expose the trusses in the interior.
- 42 My interpretation from Swedish, "ansluter till ideal som fanns i annat samtida byggande".





## Walls: Shaping a firm box

The aim of this chapter is to picture the earliest walls in the five churches and to discuss the interpretations. The question asked is, what walled structures did the mid-twelfth century roofs cover when they were first put in place. I propose to examine the various parts separately. The examination includes interpretations of traces, precise placement, orientation and chronological sequences of various parts. The search work largely from archaeological investigations, mainly of wall crests and gables in the five nave's attics. However, as the possibility to examine the walls below is so limited today, the analyses also build on understandings gathered by antiquarians and master masons during earlier restoration projects. These are available in archives.

The first sub-chapter [2.1] focus attention entirely on the nave in Forsby church. I study the different built parts [masonry walls and gables, surfaces and openings] separately. I also ask about some changes that were performed subsequently, as this help cast light back on the original situation. The second sub-chapter [2.2] build on my collected interpretations from Forsby. I focus on different parts in the five naves thematically. This is about plan proportions, as well as the walls' heights, gables, surfaces and openings.

### **2.1. WHAT WAS CONSECRATED IN FORSBY IN THE YEAR 1135?**

The felling of the timbers that the builders used to make the roof structure over the [eastern part of the present] nave in Forsby was dated to the year 1134 (Seim et al. 2015). My question here is about the masonry below. What did the nave look like when these trusses were first put in place? After a short description of the present building and an account for two restoration projects that took place in 1933 and 1979, the text is structured as a 'guided archaeological tour' around the nave's walls and gables. This focuses attention on remains and traces that

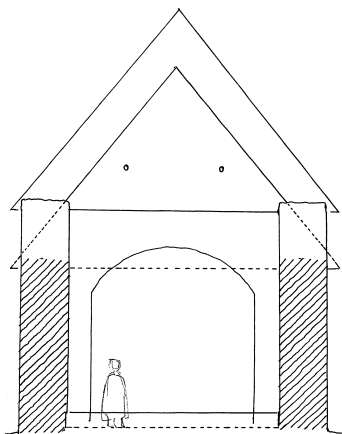
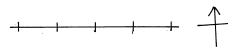
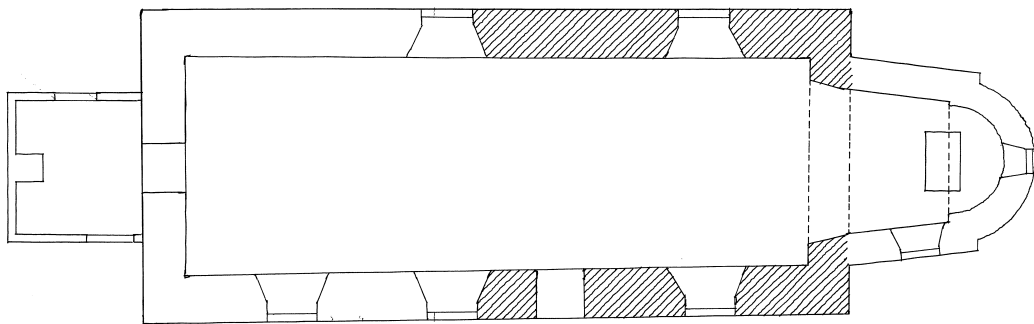
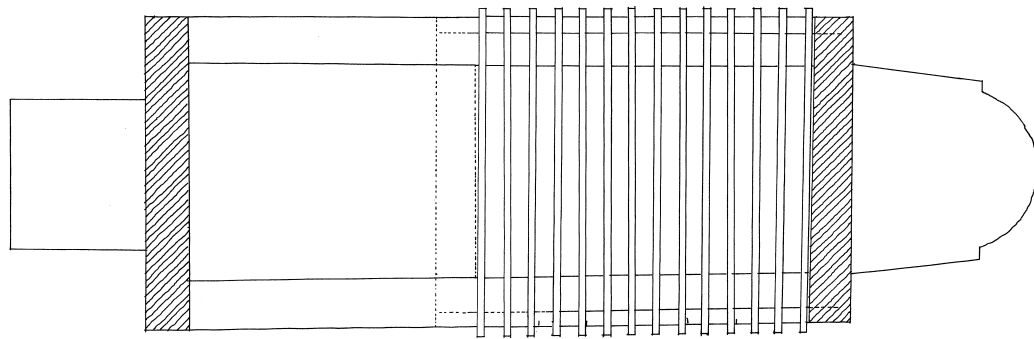
have been observed in the rooms below as well as in the attic above. Today, the two spaces are separated by a flat wooden ceiling, and the study seeks to connect them.

Analyses of the walls below the ceiling build largely on antiquarian Norberg's examination and article from the 1930s (Norberg 1939:105–113). His text is an account of the investigation he performed during the restoration project in 1933 [conducted by architect Forséen]. Antiquarian Beerståhl's and master mason Englund's notes and photographs from a renovation project [led by architect Lefvander] in 1979 add to Norberg's account. My own examinations of the wall crests and masonry gables in the attic, as well as evidence from the roof structures, help interpret the walls below. Unfortunately, there is no access to the attic over the chancel. I have therefore not been able to investigate this space, and the roof structure has not been sampled for dating.

Forsby church is situated on top of a small rounded hill, probably a burial mound (Fornsök Forsby). The rectangular nave and a separate smaller chancel with an apse are oriented west-east. Today, the thick masonry walls are plastered and white washed. The main entrance to the church is in the south nave wall. Entering, the nave room is quite long [16.5 m] and seems narrow. It is about as wide [5.5 m] as it is high. A large opening with an arch in the east nave wall gives access to the chancel. The limestone walls are plastered and the flat ceilings are made of wooden boards. The apse is covered with a helmet vault. The floors are of limestone [in the aisle] and wooden boards. The interior is bright, as large windows admit a great light in. As mentioned in the introduction, a few movable items belong, or belonged to the interior in Forsby, which are stylistically dated to the early medieval period. The altar and the font, which are still in the church, and two wooden sculptures of Christ and Maria, which are in museums.

The architect Forssén conducted the restoration in 1933. As discussed in chapter one, he was one of Curmans students. Forssén prepared for the project in 1932, and completed a number of drawings, plans and sections, as well as a short written description (ATA Forsby). The proposal for the project includes reparations of the foundation as well as the plastered limestone walls. The outermost layer of plaster on the outside was removed, and a layer underneath, which Forséen interpreted as being from the eighteenth century, was repaired (ibid). The attics and roofs were looked after. Rotten parts in the trusses were shifted out and joints were wedged if needed (ibid). Some old lime stone slabs, which Forséen found under the wooden floorboards, were reused in the aisles (ibid). The antiquarian Norberg investigated the building during the restoration works in 1933, at the request of the National Heritage Board, and he published his observations and understandings six years later (Norberg 1939:105–113).

In 1979, the outside facades were restored again. Architect Lefvander had made a program for the works some years earlier, in 1974, and according to this, the work compiled mainly exterior works; foundation, facades and roof covering (ATA Forsby). The attic was only included as the earlier insulation with sawdust was replaced with mineral wool (ibid). This time, it was antiquarian Beerståhl, who visited the work site. He photographed and wrote short notes of his observations. In both restoration projects 1933 and 1979, the opportunity



**Fig. 2.1.** **Above**, the plan of the attic over the nave in Forsby shows, the wall crests and the east roof structure with wall plates and trusses. **Below**, the plan shows the present sacristy, nave and chancel in Forsby. The original east part of the nave is highlighted. **Underneath**, the cross section [towards east] shows a seam from a lower gable crest.

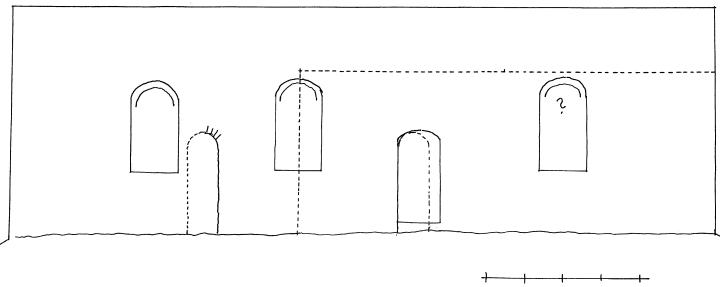
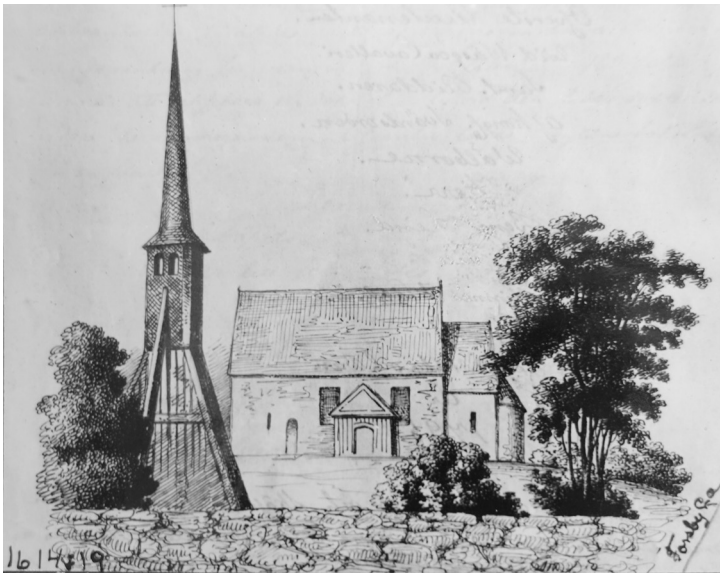
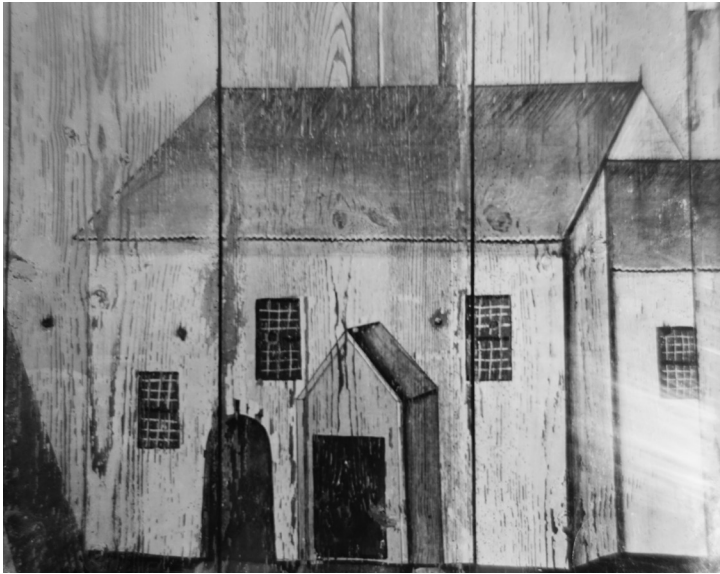
to actually observe, record and interpret occurred only for a short while, a few days. Norberg spent two days in Forsby in the summer 1933, and Beerståhl has left notes from two meetings in Forsby, in August 1979.

The guided archaeological tour thus takes place in and out of the building, with my own eyes, as well as with others', and at various times. It starts in front of an inscription in the chancel, in the summer in 1933. Forsby church stands out because of this unique inscription in the chancel, which Norberg assumed, marks the church consecration (Norberg 1939:105). It was placed on the inside of the north wall of the chancel next to the altar. Norberg explains that the scripture dates the completion of the early medieval church in Forsby (Norberg 1939:105). Because of this, Norberg claims, Forsby church has played a role in the field of art history [in Sweden] (Norberg 1939:105). He refers to a number of texts by well-known art historians and archaeologists from the late nineteenth and beginning of the twentieth centuries, e.g. Hildebrand [1872], Eckhoff [1888] and Fischer [1920] (*ibid*). However, the reading of the scripture, whether it wrote the year 1035 or the year 1135 was debated. Norberg has investigated the scripture thoroughly, and found that the letters were carved into plaster. His examination clarified that some of the letters had been re-inscribed incorrectly on a subsequent layer of plaster. He was able to remove the outer layers and see the original letters. These had been carved with a sharp pointy tool deep into the still wet plaster surface (*ibid*:105f). He also noticed traces of bright red paint in the bottom of the letters (*ibid*). Norberg finds that the letters write "XIII KL AVG DED MCXXXV ANN...", and he interprets that the date is; 13 of August 1135, and concludes that this was when the church was consecrated (*ibid*). The year 1135 have since been unquestioned. Yet the linguist Beckman finds that the date, 13 of August, is probably not the correct interpretation (Beckman 1942:371f), and he argues that the day is of importance, as it suggests what saint the church was dedicated to. Beckman suggests that the numbers should be interpreted the 20 of July (*ibid*), which was the feast day for Saint Margareta in early medieval Scandinavia (*ibid*).

### **A shorter nave**

Norberg's understanding is that both the chancel with an apse and the [eastern part of the present] nave remains from the building that was consecrated in the year 1135 (Norberg 1939:108f). He argues that the missing parts could be rather safely reconstructed (*ibid*). To examine the remaining and missing parts of the nave's masonry, our tour continues into the nave. Norberg observes traces from a previous west wall on the inside of the north wall and parts of its foundation under the wooden floor. He interprets that this was the original nave's west gable wall and that the large west part of the present nave was a subsequent addition (Norberg 1939:109f). Norberg does not provide a measure for where he observed the traces from a west wall, but makes a small plan drawing [in the scale 1:300], a suggestion for a reconstruction of an earlier and shorter nave (*ibid*: Fig 7).

Further evidence of the west addition to the nave was revealed again, more than 40 years later in the summer of 1979. This time on the outside of the south nave wall. The antiquarian



**Fig 2.2.** **Above**, painting in the ceiling in Forsby church by Risberg 1745. Photo 1933 Johansson ATA. **Below**, a drawing by Brusewitz from the 1860s. Photo 1933 And:son ATA. **Underneath**, drawing of the south façade with two medieval doors. The door towards east is probably in the same place as an original door to the nave. The one towards west belongs to the subsequent extension of the nave. It was 80 cm wide and 2.5 m high with a rounded arch.

Beerståhl lets us in on two meetings [the 14 and 20 of August], which were held during the restoration project (ATA Forsby). Beerståhl notes that more or less all plaster, both older and newer layers, had been removed from the nave's south wall<sup>2</sup> (ibid). The bare stones could thus be examined, and Beerståhl observes a vertical seam in the masonry, between the east [older] and west [newer] part of the nave. He takes notes and photographs<sup>3</sup> of this, and explains the position of the seam, in relation to the present window<sup>4</sup> (ibid). Beerståhl finds that the stones in the east [older] part have a raw surface and that they are coloured grey or grey-blue as opposed to the west [newer] part where the stones are red-brown<sup>5</sup> (ibid). He measures the total length of the east part of the nave to 11 m (ibid). It is still possible to 'see' this seam in the masonry today, as the masons drew lines in the new plaster in front of it, on both the south and north walls in 1979. Measuring again in 2014, I find that the distance is a little bit less than 11 m. However, it is not possible to compare the measures precisely as the walls are not vertical, and Beerståhl does not comment on how high up from the ground he took the measure. In fact, when I measured the plan lay-out in a coordinate system, in the attic, the nave's plan structure is not completely right-angled either, and the distance from the east gable wall to the seam differ slightly, 10.80 [south wall] and 10.95 m [north wall].

The masons drew this line all the way up to the eave. This indicates that the seam should be possible to observe from the attic. However, oddly, I have not been able to find a corresponding trace between an east and west part in the masonry from the attic. Further, remains from the west wall, which Norberg found traces of, are completely absent in the attic. Looking at the wall crests in the attic, it is notable that these embed both wall plates and tie beams into the masonry. The timbers were set in a neat stone and mortar 'package'. This was finished with a fine and smooth plaster surface, and notably, this same construction occurs uninterrupted all along the 16.5 m of the present nave, i.e. throughout both the east and west parts of the nave.

Instead, to determine the precise length of the shorter east nave room, I examine the roofs. The roof over the east part of the nave is different from the west part. The two roof structures have some similarities. Both have trusses with tiebeams, they are of the common-tiebeam form. All trusses were made of pine, and even if the timbers in the two structures were not prepared in exactly the same way, they were both prepared in a medieval manner (cf. Gullbrandsson 2015:63). The tie beams in both structures were fitted to a cogged wall plate, which was placed in the outer side of each wall. However, the two structures also differ. The east structure has tie beam trusses with six crossing struts and the west structure has tie beam trusses with two crossing struts and collars. The dendrochronological wood samples show that even if both truss types were made of Scots pine, the wood is different and the trees could not have been felled in the same type of forest (Seim et. al 2015:46f). A felling date could not be identified for the west roof structure as none of the samples could be synchronized to a reference chronology (ibid). The wood in the east roof structure on the other hand has been dated precisely; the trees were felled in the spring or early summer of the year 1134 (ibid) and it was likely constructed while still green, shortly after the felling.

The east roof structure contains fourteen tiebeam trusses and twelve of these have six crossing struts. The truss spacing is consistent and about 65 cm. The two outermost trusses, the one right next to the east gable and the other most western [now in the middle of the present attic] are both weather-beaten. The most western truss is located where the two wall plates over the east part ends<sup>6</sup>. The truss next to the east gable has four crossing struts. In this truss, the thin rafters and four struts are joined to the west side of the broader tie beam. Thus, the level 'front' side faces the room below. The most western truss is not complete<sup>7</sup>, but the rafters and struts were joined to the east side of the broad tie beam, thus allowing the 'front' side to face the room, also in this end of the structure. I interpret that these two outermost trusses in the east roof structure were gable-trusses.

Measuring the length span of all fourteen trusses, from the east gable [= the outside of the truss] to the west side of the west 'gable' truss, the distance is 8.8 m. This suggests the place for the missing west gable and the length of the inside in the older nave-room. This would be the room the trusses once covered. Adding about a meter for each gable wall, the outside length of the older, shorter nave would theoretically be 10.80 m. The width of the nave room, the internal span between the south and north walls, is 5.5 m, measured in the attic. This distance is, give or take a few centimetres, the same in the nave-room below.

Norberg observed traces of a west wall in 1933, and Beerståhl observes a vertical seam in the stripped masonry in 1979. Adding the evidence in the form of a clearly separate and preserved eastern roof structure, made from timbers felled in 1134, I find that the nave was most likely a shorter room to begin with. I suggest that this room was 8.8 m long and 5.5 m wide inside. The fact that there are no traces of a west wall in the attic above is probably because it was demolished. However, the suggestion requires a further investigation into the puzzling fact that I have not found the seam between the two masonry structures from the attic side, and that the same mortar 'package', embeds both roofs.

### **A lower nave**

Beerståhl observes and comments on yet another seam in 1979. It is the trace of a previous and lower, east gable, which he could see from the outside, when the east nave wall had been stripped from plaster. The lower previous gable top has the same angle as the subsequent [present] gable, and thus of course, the same angle as the trusses. Beerståhl took a photo of the seam from the outside. It is visible over the chancel roof and he comments that this is a trace from an extension on top of the nave's east gable<sup>8</sup> (ATA Forsby). Looking at a blow up of the photograph the joint is clearly visible. This trace of the lower gable was soon hidden again behind a new plaster layer in 1979, and the masons did not mark this seam with a line in the new plaster. However, from the inside, standing in front of the same east gable in the attic, the seam is unmistakably there. The inside of the east gable masonry lacks plaster, which means that it is possible to examine the original mortar. The mortar in the lower gable top contains small black particles, and thus differs from the subsequent mortar in the

masonry on top. Following the line of the lower gable to where it meets the north and south walls, shows that the earlier height of the nave was about 4.5 m over the ground outside. This means that the walls were, earlier, about 1 m lower than today.

Looking at Beerståhl's photos from the stripped south wall again, with this in mind, one colour photo stands out. Beerståhl took a picture to show the vertical seam between the east and west part, at close range from the top of the scaffolding. He is standing just over the arched window. It is not obvious because the photo is so faded and pale; however, the vertical seam does not seem to go all the way up to the eave [as the masons drew in the plaster]. It stops a short distance over the window arch, which is about 1 m under the eave. Indeed, there is a shift in the masonry over this level. The layers seem to go through, even if there are two diagonal cracks in the masonry that continue up. Unfortunately, it is not possible to see a horizontal seam in the picture. There may have been one to observe in 1979, perhaps indicated by differing mortars, as in the gable. However, Beerståhl does not comment on this. On the other hand, the height suggested in this photograph fits well with the height indicated by the angle of the lower east gable. With this, I argue that the nave was not just shorter, but most likely also lower. This would explain why the masonry is continuing uninterrupted in the upper parts of the north and south walls and why the vertical seam appears to be 'missing' in the attic. It was probably just never there.

Two small symmetrically placed holes occur, on the inside of the lower east gable. These still contain small pieces of wood, which is stuck on the mortar surface in the hole. They are likely the remains from scaffolding. In order to cast light on the question, if the lower gable should be connected to the inscription in the chancel, and the east roof, a sample was taken for analysis. The wood was identified as the species Poplar wood (Seim et al 2015:42) which supports the interpretation that it is remains from scaffolding. The <sup>14</sup>C analyses suggest a calibrated interval 1045–1167<sup>9</sup>. I assume that the scaffolding was made from relatively thin tree trunks, and therefore not many years should be added to the interpreted interval. Thus, the east roof [1134] probably belong to the same building phase as the lower east gable, as well as the year inscribed in the chancel [1135].

### **The first surfaces**

In connection with the investigation of the inscribed letters in the chancel, Norberg noted that the plaster [on the north side in the chancel], was smooth and coloured pale pinkish (Norberg 1939:105). However, he does not account for any original plaster surfaces surrounding the inscription, or in other parts of the chancel, or in the nave. Norberg do examine the walls in the nave, but he is looking for medieval paintings, not for plaster. Norberg observes a few indistinct remains of paintings. One is a string of letters behind the pulpit on the north wall, which he interprets being "Romanesque and in any case not later than fourteenth century", based on the form of one of the letters (Norberg 1939:111)<sup>10</sup>. He also notes a decorative pattern painted in black, grey and red-brown, and some indistinct figures, high up in the southeast corner of the nave. The art historian Viola Hernfjell (1993) agrees with Norberg that the painted remains in Forsby are "Romanesque" (ibid:175).





**Fig. 2.3.** **Above**, a view of the east gable in the nave in Forsby from the attic. The seam from a lower gable structure is visible. The mortar in the lower part contains small black particles of coal and is different from the mortar in the subsequent masonry on top. This may be connected to the remains of a limekiln filled with crushed limestone and charcoals, which was found outside the churchyard (Fornsök Forsby). The hole in the lower gable, which is likely from scaffolding, still contain small pieces of wood, and a sample has been identified as the species poplar wood (Seim et al 2015:42). Photo 2015. **Left**, a previous stone floor in the nave in Forsby, close to the north wall, which Norberg interpreted as original. Photo Norberg 1933, ATA.

Even if almost all of the plaster was removed from the outside of the south wall in 1979, Beerståhl observes a few traces that he interprets as the first layer of [lime] plaster. He does not note precisely where on the south wall these remains were, but he observes that the layer is thin and smooth with a cream yellow colour. He explains that the layer was sticking very hard to the stone surface; indeed, he points out that the masons had to use a jackhammer to remove it<sup>11</sup> (ATA Forsby).

Beerståhl notes that old layers of plaster were still in place on the outside of the [east part of the] north wall in 1979. He examines the preserved layers together with master mason Englund the 20 of August, and take notes. They identify two innermost layers, which they interpret being both medieval. First, applied directly on the limestone wall, they find a mortar-layer made with clay, which was polluted with small black particles. They identify the small particles as coal. They agree that the surface of this mortar had clearly been exposed to weather conditions, before it was covered with subsequent layers. They interpret that the church walls might have been standing without a proper plaster layer for a longer time<sup>12</sup> (ATA Forsby). Englund suggests that this, the mortar with small black coal particles, was put on in 1135<sup>13</sup> (ibid). The next layer was made with a rich lime plaster, which was smooth and had a cream yellow colour<sup>14</sup> (ibid). Beerståhl's description of this plaster fits well his account of the first plaster layer found on the south wall.

The remains of plaster on the north wall in the chancel, dated by the letters inscribed into wet plaster in 1135, hint that also the other in-sides in the chancel may have been plastered then. However, there is no account of plaster in the nave. Norberg did not look for it, there may, or may not have been. However, the east masonry gable that was originally visible from the room below [now in the attic], which has a mortar surface similar to the one described by Beerståhl in 1979 on the north outside, suggest that the inside walls in the nave were not plastered. The remains of paintings found on lime plaster surfaces, high up on the walls in the nave consequently probably belong to the subsequent, extended and higher nave.

### **Openings in the shorter and lower nave**

Norberg examines the main doorway in 1933. This is placed in the middle of the present nave's south wall, in between the eastern and middle of the three large windows. In the earlier shorter nave, this door opening would have been in the very west end of the south wall. Norberg finds that the opening likely is in its original location and he notes that posts had been put into the masonry walls<sup>15</sup>. Norberg explains that the posts were there to mount hinges and locks. He finds that they had been subsequently cut off<sup>16</sup>, and he concludes that the opening originally was narrower<sup>17</sup> (Norberg 1939:110). The architect Forssén mentions this door opening too, in a letter, as he makes an argument to widen it [even more]. He points out that the sides of the opening had already been subsequently widened, and claims that traces from the original opening were lacking<sup>18</sup> (ATA Forsby). Beerståhl comments shortly on a photograph he took of the same door opening in 1979. He notes that he observed a trace in the masonry, which shows that the opening had once been higher than the present<sup>19</sup>

(ibid). Precisely how high and how the higher top was formed is not clear in the picture, and Beerstahl does not comment on it. Neither Norberg nor Beerstahl mentions a door opening in the north wall. However, this does not mean, for certain, that there never was one, as the plaster was not removed from all parts of the north wall. If there was an opening in the west wall, this is long gone. From inside the nave Norberg notes that the opening with a triumphal arch in the east gable wall, which connects the nave and the chancel, had been widened, and he identifies some stones from the wall's foundation (Norberg 1939:110). He suggests that the nave was almost entirely separated from the chancel (ibid).

Norberg finds no traces from original windows in the nave (Norberg 1939:110), and Beerstahl does not comment on or take pictures of any traces from what could be interpreted as original window openings in the shorter lower nave. As with door openings, this does not mean for sure that there was no window to the nave originally. An earlier window could have been placed in the [shorter and lower part of the] south wall, where there is now a large window, east of the entrance door. It is not impossible that there was a window in the north side, it could have been placed where there is a large window today. If there was ever a window opening in the west wall this evidence is gone. There could also possibly have been a small opening set very low in the east gable. However, this presupposes that the chancel was quite a bit lower. Finally, the trusses in the east roof structure suggest a possibility for yet a window opening. The twelve trusses in between the two gable-trusses in the east part have each six crossing struts. These trusses have the same shape in principal. However, the crossing struts in four trusses [from the middle and towards east], were slightly shifted in relation to each other. The effect is that they form an angled 'tunnel', from down below over the middle of the nave-room, and up towards the ridge and east. The tunnel does not go all the way to the east gable; it ends at the ridge three trusses from the gable. I interpret that it is possible that the roof had an opening there, a 'wind-eye'.

Accordingly, I suggest that the east roof over the nave in Forsby is not in its original location; the trusses were subsequently moved up, about 1 m, and they were reused when the west extension was raised. The nave was probably, extended and heightened at the same time. I thereby suggest that the wooden trusses in Forsby were put up in the year 1135 to cover a rectangular nave with the inside plan proportions 5.5 m x 8.8 m. The 1 m thick limestone walls, I argue, were at this time only about 4.5 m high. The nave's surfaces did not have a plaster layer, just a smeared out mortar.

The felling date 1134, matches the year 1135 that was inscribed in wet plaster in the chancel. This suggests that the chancel existed at the same time as the low nave. However, the chancel was probably [as the nave] lower than today. Norberg's photo from the attic over the chancel in 1933 shows a trace in the east gable that could hint to this. The lower part of the apse could have been built at this time, or it could have been added on later. Further, I find that there are possibilities for various openings, holes in the nave's masonry walls that were there in 1135, though no single one is certain. There was most likely a small triumphal arch leading in to the chancel through the east wall. The nave most likely had a narrow door in the south wall, close to the original southwest corner [the same place as the present wider

door]. It is not impossible that there was a door opposite to this, in the north wall close to the northwest corner, which was closed at some point. Neither Norberg nor Beersthål searched for a north doorway. There may also have been a door in the original [abolished] west wall. If so, this door with portal was perhaps reused and fitted into the new extended south wall, only a few m away. I interpret that the walled up doorway, which Beersthål recorded in the south wall in 1979 [80 cm wide and 2.5 m high with a rounded arch] could be the remains of this. The two doors in the south façade, one that gave direct access to the original nave and the other into the west extension were located close to each other.

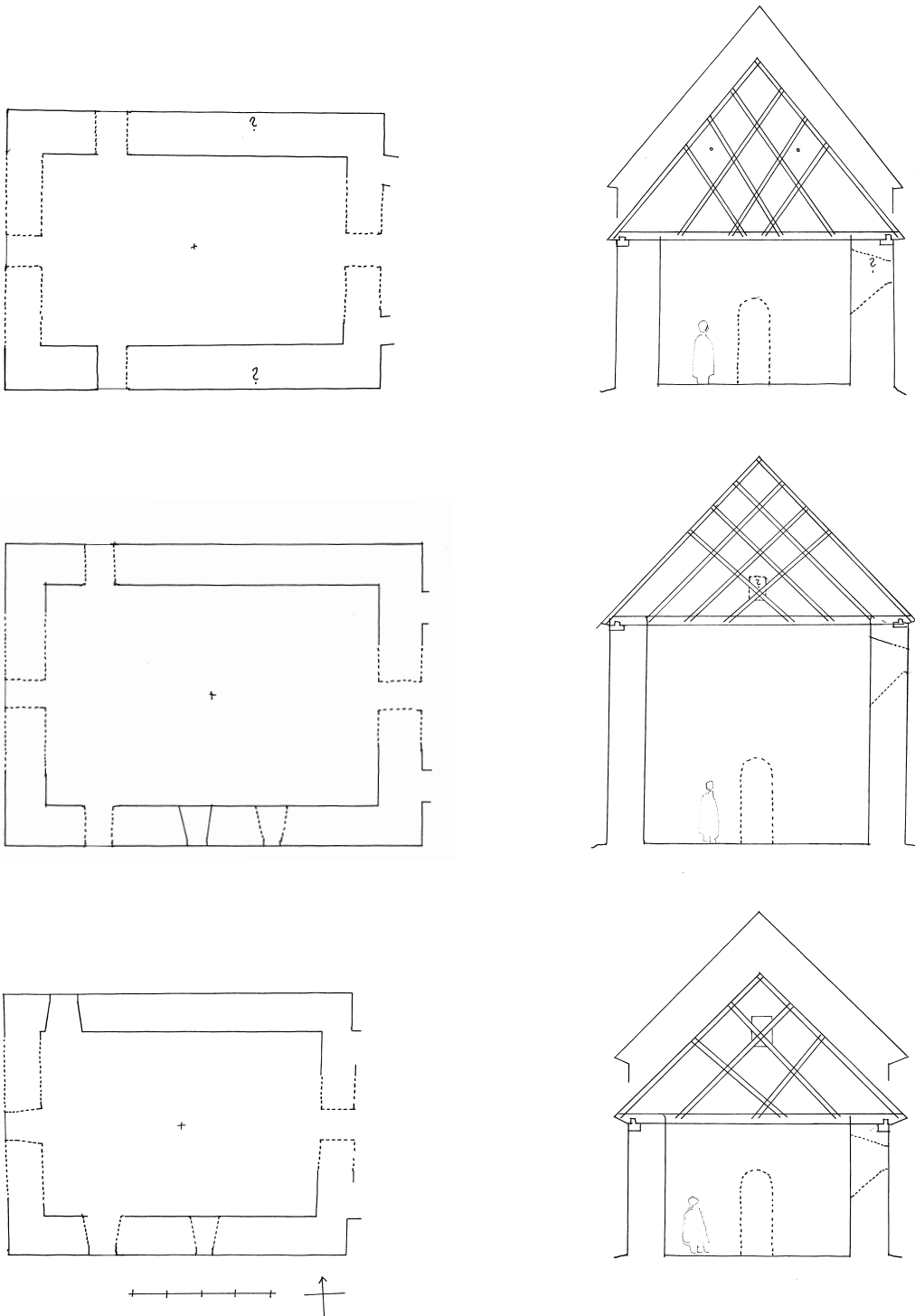
There may have been windows in the lower south and north walls, if these were located where the present large windows are today. There are no trace of a window in the east gable top. There may have been an opening in the west gable top. Finally, it is not impossible that the roof had a wind-eye.

## **2.2. MASONRY, PLAN PROPORTIONS, HEIGHTS AND OPENINGS**

With the understandings from the nave in Forsby in mind, I examine the different parts in the five naves thematically. This is about the masonry, plan proportions and the walls' heights and openings. As in Forsby I work from archaeological investigations of wall crests and gables in the nave's attics. However, the exploration also builds on Beersthål's short comments on a few photos from Gökhem in 1967, antiquarian Claesson's explanations of the masonry in Gamla Eriksberg in 1989, and finally a report from Marka in 1995, with photos and drawings by Hasselgren, which includes observations made by antiquarian Sigsjö and master mason Johansson.

Four naves [Forsby, Gökhem, Forshem and Marka] have wall crests and/or gables, which are visible in the attics and reveal glimpses of what I interpret is mid-twelfth century masonry. Like in Forsby, the walls in Gökhem, and Marka were made with coarse limestone, in relatively even shifts, but with varying heights. Beersthål took photos when the plaster was more or less removed from the exterior walls in Gökhem in 1967 (ATA Gökhem), which show parts of the north, east and south walls of the nave. He does not comment in detail on the masonry, in the way he did in Forsby, however generally the walls look to be relatively even and made of limestone. Hasselgren, Sigsjö and Johansson report about the same from their examinations of the bare exterior walls in Marka in 1995 (ATA Marka). However, they note that there were larger stones, up to 30 cm high, in the bottom parts of the nave's south wall. The walls in the nave in Forshem are quite different as they were made with finely prepared squared sandstone. This masonry is still visible in the attic. However, there is not much left of the walls below the vaults in Forshem, most of the north and south walls were removed in the eighteenth century, a later tower cover the west gable, and the subsequent chancel cover most of the east wall.

Three naves have wall crests and/or gables that are so intact that width and length of the room below can be measured in the attics, in direct connection to the roofs. The inside measures of these nave-rooms are only slightly different, the widths vary less, however, the



**Fig. 2.4.** Plans and cross-sections show the mid-twelfth century naves with interpreted heights and 'not impossible' doors, **above** Forsby, **below** Gökhem, and **underneath** Marka.

lengths a little more [Gökhem 6.5 x 9.7 m, Forshem 6.1 x 10.5 m, and Marka 5.4 x 8–8.2 m]. Only few irregularities occur. The plan in Marka is slightly wider in the west end. Gökhem was probably straight to begin with, but there is a small deformation in the south wall. The interpreted plan proportions in Forsby [5.5 x 8.8 m = 1.62] are in between the three other rooms, Gökhem [1.49], Marka [1.48–1.52] and Forshem [1.72]<sup>20</sup>.

The masonry walls and plan proportions in the nave in Gamla Eriksberg are uncertain. The oldest roof structure [dated 1150s] covers most of the present nave-room. The trusses start by the east gable and continue towards west. However, there is no west gable or wall below where this roof [including wall plates and trusses] ends. Instead, subsequent trusses cover the rest of the nave. Even if this west part is smaller than the west extension in Forsby, the situation in Gamla Eriksberg resembles this. However, antiquarian Claesson, who investigated the masonry in 1989 (ATA Gamla Eriksberg), in connection with that the walls were stripped of all plaster, interprets the situation differently. Claesson describes the original masonry in the nave, which he finds preserved mainly in the north wall. The north wall had layers of large fieldstones [up to 0.5 m], which were prepared to form a smooth outside surface. In between were thinner shifts with limestone. Claesson finds that the original masonry is intact all along the nave's north wall, from east to west. Thus, he concludes that the nave was this long to begin with, it had not been extended in a later building phase (ibid). In addition, he finds that the west wall and the west part of the south wall had been completely re-made, and argues that the damage in the southwest part of the nave probably also affected the roof, and that therefore some of the original trusses were replaced (ibid).

On the one hand, as Claesson examined the walls when the plaster was removed, his argument is strong. He looked for a seam between an east [older] and west [newer] part of the nave, and found that there was none. Claesson's suggestion sketches a narrow, long floorplan, which proportions, compared to the other four naves, is quite different [5.1 x 10.7 m = 2.09]. On the other hand, if I interpret that this roof is complete with the present 13 trusses and wall plates, the proportions of a room below would fit the other naves better [5.1 x 8 m = 1.6]. Therefore, I argue that this roof may indeed have covered a shorter room when it was new. The masonry walls cannot be dated independently. It is not impossible that the roof belonged to an earlier church, which was torn down completely, or perhaps, as in Forsby the trusses were moved up onto raised, higher and longer walls.

The nave in Marka may have been subjected to similar changes as in Forsby, even though the traces are more subtle and vague. As in Forsby, the east gable in Marka seem to have been extended upwards. However, there is not a clear seam between a lower and upper gable top. If I imagine the uncertain previous lower roofline at the same angle as the present, this would fit with a height a little more than 4 m. There is a visible trace, a lower seam, in the east gable of the chancel. This seam is relatively clear. Therefore I suggest that the roof over the chancel was probably reused, and moved up. The timbers have the same felling date as the roof over the nave. Another hint to that there may have been changes is that the tiebeams are not well imbedded in the wall crests. Question is too, if the west gable belong to the mid-twelfth century, as it is quite a bit thicker [c. 100 cm] than the east gable top [c. 70–80 cm]. Therefore,

I interpret that it is possible that the roof over the nave in Marka is not in its original location; the trusses may have been subsequently moved up, a little more than 1 m. They may have been, as in Forsby, reused when the walls were made higher. I suggest that the trusses in Marka, in the year 1156 or shortly after, were put up to cover a rectangular nave with the same plan proportions as today [5.4 x c. 8 m]. However, the 1 m thick limestone walls, I argue, were at this time lower, maybe about 4–4.5 m high.

The naves in Forshem and Gökhem were likely as high as they are today, and I interpret that the roofs are still in situ. I have not found any traces or irregularities in the masonry, which point to that these two nave's walls were raised up to a higher level subsequently. As in Forsby, two holes on the inside of the east gable top in Gökhem are likely the remains from scaffolding, which contain small pieces of wood. A sample was taken for <sup>14</sup>C analyses analysis as an extra check, and this suggest a calibrated interval 1025–1150 (Plicht 2014). As in Forsby, I assume that the scaffolding was made from relatively thin tree trunks, and therefore not many years should be added. The result supports the interpretation that the east gable is consistent with the felling date of the timbers in the roof [1140]. The height of both naves is similar, about 6.5 m.

There is not much left of the north and south walls in Forshem, as most of the masonry was removed in the eighteenth century. The gable walls are in place, but largely hidden behind a late nineteenth century west tower, and the subsequent thirteenth century chancel. The walls in Gökhem, are largely preserved. It is possible that the west gable wall is less intact, as it does not have a masonry gable top. This could have been torn down subsequently. However, it is not certain that the original top was raised with masonry; it could have been covered with wooden boards. Pointing to this latter interpretation is the fact that the wall crest, which is at the same level as the north and south wall crests, was equally, neatly finished.

The original doors and windows in Gamla Eriksberg and Forshem are not possible to investigate and interpret safely. However, the nave in Gamla Eriksberg have existing openings, and in Forshem there are reused decorative parts from portals. These suggest that the two naves had three doors leading into the nave, in the north, west and south walls originally. In both Gökhem and Marka, there are traces of doors to the nave. Hasselgren recorded traces from an entrance in the south wall in Marka [c. 1 m wide and 2.4 m high, with a round arch], which was located close to the southwest corner of the room (ATA Marka). Beerstahl took a photo of a trace from a similar opening in the south wall, in the same southwest location in the nave in Gökhem (ATA Gökhem). There is today a large arched opening in the original west wall, in both Marka and Gökhem. This connects to rooms that were added on subsequently, later in the medieval period. However, it is not impossible that there was an entrance in the middle of these west walls, when the rooms were new. There is still today a door in the nave's north wall in Marka. It is likely that this opening is original. The portal has a heavy wooden ironclad door. In Gökhem, there is today a larger opening in the same northwest corner. This was enlarged in the eighteenth century however; there was a door there, before this (ATA Gökhem). The present entrance to the nave in Gökhem [i.e. in the

north porch] has rounded stone portal and the door is similar to the door in Marka, which is heavy, wooden and ironclad. This door with portal in Gökhem was earlier placed in the north wall of the subsequent medieval west addition [where there is now a window]. The portal and door was moved when the entrance in the north porch was opened in 1775 (ATA Gökhem). I propose that this ironclad door in Gökhem may have been moved once before, from its original position in the nave's west wall, to the north wall of the west addition. This would be similar to the two doors in the south wall in Forsby. Towards east, there was likely a triumphal arch, a small opening in the wall, which gave access to the chancel. Today there is a larger opening here in both Marka and Gökhem.

The remains from a small medieval window is visible in the south façade in Marka. This is set about 2.5 m over the ground and placed about 4.4 m from the inside of the original west wall. This is just east of the middle of the room. Thus, this window would have cast light into the middle of the original nave-room. In Gökhem, there are remains of two small windows, which are located high up in the south wall. They are both visible on two of Beerståhl's photos from 1967 (ATA Gökhem). The inside of the window towards west is still visible in the attic. They were set more or less on both sides of the middle of the room. There are no accounts or traces of windows in the north walls in either Marka or Gökhem. However, there may have been, if these were located where the present large windows are today. There is an original opening in the east gable top in Marka. There may have been a small opening in the east gable top in Gökhem, if this was placed where there is now a larger subsequent opening. There may have been opening in the west gable top in both churches' naves. Finally, it is not impossible that the roofs had a wind-eye.

**Fig. 2.5.** Portals with ironclad wooden doors in Marka and Gökhem churches. **Above left,** the north entrance to the nave in Marka, from the inside. This has a robust wooden lock. The wooden boards are well preserved and could probably be dated with dendrochronology in the future. Photo 2015. **Above right,** is the same door viewed from the ironclad outside, i.e. now from the present porch. Photo 2015. **Below left,** the trace from a south entrance in Gökhem. Photo 2015. **Below right,** is the ironclad door with stone portal in the present north entrance in Gökhem. The photo was taken when the plaster was removed in 1967. Photo Beerståhl, ATA.







**Fig. 2.6.** **Above**, Marka church, opening in the gable top towards east, which most likely was outside in the mid-twelfth century. Photo 2015. **Below left**, Gökhem church, the top of the west of two windows remains visible from the attic. It is located right under the tiebeams. Photo 2015. **Below right**, the inside of the south wall over the vaults. The picture was taken from the space between on top of the vaults and underneath the tiebeams. The plaster is most likely not original. It was probably put up after a ceiling of boards was nailed into the undersides of the tiebeams, and before the vaults were raised. Photo 2015.

## Notes chapter two

- 1 A surplice is a loose-fitting, broad-sleeved white liturgical vestment.
- 2 My interpretations from Swedish, "Avlägsnandet av gammal puts hade redan fortskridit så långt på kyrkans S sida, att så gott som ingenting fanns kvar av äldre putslager".
- 3 Color slides: 6, 7 and 8.
- 4 My interpretations from Swedish, "Byggnadsskarven på sydsidan under 2:a fönstret från V 40 cm från fönstrets V smyg".
- 5 My interpretations from Swedish, "Stenmaterialet i den medeltida muren är kalksten i tunna skift med råhuggen yta. Färgen på kalkstenen är grå eller gråblå /.../ medan de nyuppförda partierna /.../ har en kalksten med rödbrun ton.
- 6 The north [east] wall plate is of pine and consistent with the felling date 1135. The south [east] wall plate is of oak and the tree was felled between 1134 and 1149. The two wall plates continue a little past both the two outermost trusses in the roof. To the east, the wall plates were built into the gable masonry. To the west, the wall plate on the south side of the nave is completely eroded and could not be measured, but the wall plate on the north side continues past the truss and ends about 40 cm after.
- 7 Only the north rafter, two crossing struts and part of the tie beam (the north end) are still in place.
- 8 1979-08-20, my interpretation from Swedish, "långhusets gavel mot öster (samt kor). Påbyggnadsskarv på långhusets östra gavel".
- 9 One Sigma Ranges: [start:end] relative area, [cal AD 1045: cal AD 1096] 0,569877, [cal AD 1119: cal AD 1142] 0,216088, [cal AD 1146: cal AD 1167] 0,214034. Two Sigma Ranges: [start:end] relative area, [cal AD 1037: cal AD 1193] 0,969586, [cal AD 1196: cal AD 1206] 0,030414 (Seim et al 2015:42 <sup>14</sup>C based on report by Plicht 2013)
- 10 My interpretation from Swedish, "att döma av bokstaven G:s form ha de varit romanska och i varje fall icke senare än från 1300-talet".
- 11 My interpretation from Swedish, "Några mindre partier [på långhusets södra fasad] /.../ visade följande puttskikt: Närmast den fogstrukna väggen låg på den medeltida muren en tunn gräddgul puts /.../ den äldre putsen på långhusets sydsida häftade åtminstone delvis så hårt vid murverket att den måste bilas bort med tryckluftsborr".
- 12 My interpretation from Swedish, "[putsen hade] kommit på plats ganska långt efter uppförandet (Kyrkans murar kan ha stått oputsade en längre tid)".
- 13 My interpretation from Swedish, "ett grovt lerbruk med små svarta korn (kolbitar) som förorening, vilket Englund antog kunna vara från 1135".
- 14 My interpretation from Swedish, "ett slätt, homogent (fett) gräddgult bruk, som byggmästare Englund trodde kommit på plats ganska långt efter uppförandet".
- 15 I interpret that this was on each side of the opening.
- 16 I interpret from this that they were visible to him in 1933, over the then widened door opening.
- 17 My interpretation from Swedish, "Den ursprungliga huvudingången i söder har befunnit sig på samma plats som den nuvarande, men den har varit smalare, ty i väggarna kvarsutto ännu de inmurade stockar, som tjänat till fäste för gångjärn och lås, och dessa stockar hade kapats av vid någon tidigare ombyggnad".
- 18 My interpretation from Swedish, "södra ingången /.../ är upptagen i mycket sen tid. Spår av någon äldre ingång på samma plats kunde ej iakttagas".
- 19 My interpretation from a comment on Color slide 5, "Igenmurad högre portal på platsen för nuv. Sydportal".
- 20 The proportions are not far from a golden rectangle [1.618].



## Roofs: Adding a lively top

This chapter focuses the roof constructions in the five churches in Västergötland. Even if the walls were of stone, other parts i.e. roofs, doors, windows, possibly floors, as well as most interior objects, were made of wood. Apart from the roofs, almost all of the wood is gone. The study incorporates new evidence, and places the interpretations within historical and architectural contexts. The work builds mainly on investigations in the five church attics. In addition, the study depends largely on comparison with other surviving early roofs. The survey and catalogue by Gullbrandsson (2015) which presents roofs of the common-tiebeam form [fragments or complete] in a large number of churches in Västergötland, is essential to the work. The five roofs are part of this unique gathering. The identification and analyses of common-tiebeam roofs, in over 250 churches in north-west Europe and Scandinavia, offered by Courteney & Alcock (2015), are equally important. Their study has brought together a number of regional studies and surveys from northwest Europe and Scandinavia (ibid:137).

Trusses are primarily load-carrying systems. The trusses in the five roofs notably have a horizontal tiebeam at their base. A damaged tiebeam makes the structure stressed, and can cause deformation in the walls below (Thelin 2006 [VI: 14–16]). Indeed, in three of the churches in focus, Forshem, Gökhem and Marka, builders subsequently cut some tiebeams off to create space for vaults. This is now centuries ago. How to solve such problems is a challenging undertaking. Specialist in resistance of materials and historical roofs Ylva Sandin underlines, in a report about Marka church (Sandin 2016), that the common-tiebeam construction type is valuable because it has proved to be so exceptionally sustainable, arguing that the trusses have carried load for more than 850 years. The roof in the Marka show that constructions made of wood can in fact be long lasting. Sandin also points out that the preserved wooden structure itself, also in its damaged state, is a rich and valuable historical document, and that the attic is a unique spatial environment.

In this chapter, I should like to add to this last perspective. Courteney & Alcock find that the carpentry in the roof in for example Gökhem is so refined that it was likely visible from the nave below to begin with (Courteney & Alcock 2015:162), and Sjömar comes to the same conclusion about the roof in Hagebyhöga church in Östergötland, east Sweden (Sjömar 1995). With this in mind, I propose that the five roofs in Västergötland were once visible. Thus, the roofs of wood were significant elements in the interiors, and I seek to shift the focus a nuance, from how the wooden constructions carry load to how they were articulated as elements of architecture. The aim in this chapter is to explore the character of the ‘top’ of the five [box-shaped] nave rooms. Two basic questions guides the work, 1) what are the characteristic features of the five roofs, and 2) how do the wooden constructions relate to the room below?

The five roofs have a number of things in common. One is that they have survived almost complete, i.e. most parts remain, offering to be examined without the need for previous reconstruction [on paper]. The roofs are still in function even if some parts are not intact. The five roofs stand out in particular because dendrochronology has dated the felling of timbers in all five structures to the mid-twelfth century: Forsby 1134, Gökhem 1140, Forshem 1151+10, and Marka 1155 (Seim et al 2015). In Gamla Eriksberg, the roof over the nave dates to 1140s or 1150s<sup>1</sup> (Seim & Linderholm forthcoming). Bråthen dates the roof in Gamla Eriksberg from the outermost part in one sample to winter/spring of 1152/1153 (Bråthen 1982). Further, the five roofs were placed over the same kind of rooms, the naves with masonry walls, and finally, they were raised in local communities in the same region and they encircle the Diocese centre Skara.

When the thesis project started, I assumed that all five roofs were still in their original place. However, as highlighted in the previous chapter [2], only two, the roofs in Gökhem and Forshem churches, are likely still in situ. The walls in two, Forsby and Marka were probably also alsoelevated subsequently and Gamla Eriksberg is uncertain. Examinations of original outer roofing has had to be excluded, since it is only reliably obtainable from further extensive and detailed investigations of very few and uncertain traces. I have not found remains of original roofing over the five naves. However, a few Swedish studies have examined wooden boards that cover/covered the rafters, perhaps in their turn protected with another layer of boards or wooden shingles, e.g. Olofsson & Holm (2015) [Kyrkås and Norderö churches in Jämtland], and Blomberg & Linscott (2001) [Högs church in Hälsingland].

In the subchapter 3.1. I cast light on the wood materials and relate the five roofs’ constructions to principles of the common-tiebeam type. Further, questions about the large numbers of tiebeams in the five roofs are introduced, and I seek to link them to other, similar roofs in Västergötland. In subchapter 3.2. I explore the significance of the tiebeams by searching for alternative twelfth century roofs with fewer tiebeams, and connections to wooden building practices, through a close look at the intersection between the tiebeam and wall plates. In subchapter 3.3. I propose that the roofs were active parts of the architecture, and explore characteristic features in three themes, 1) the various shapes, 2) the sense of flowing and billowing, and finally 3) the particular elements in the roof in Gökhem.

Thereafter I examine how different parts and forms in the roof in Gökhem are oriented and placed. In subchapter 3.4. I try to take this further by exploring how the articulations in the roofs were connected to, and may have influenced, the walled 'box' below in various ways.

### **Rules and leeway in the making of trusses**

The exploration of the five roofs builds on evidence that the twelfth century carpenters were skilled, and that they worked within established wood working traditions (e.g. Sjömar 1995; Storsletten 2002a:355ff). In traditional making, one maker passes skills on to another, and models guides the production. Thus, there were probably guidelines, both to what a proper common-tiebeam truss ought to look like, and how the timbers should be prepared and put together. At the same time, the roofs are not completely alike; they vary, and include for example different numbers of struts, within the truss' frame.

Asking about aesthetics, I here draw on philosopher Mikkel Tin's approach, as he examines traditional aesthetics in handicrafts (Tin 2011). Tin uses the dichotomy 'rules and leeway' as a figure of thought. He points out that this approach differs from art history, because the various art styles reflects a number of shifts, rather than individual variations on collective themes (ibid:246). An artisan acquires skill, the ability to make something in a particular way, through training. This, Tin argues, "transfer capabilities from the mind to the fingers" and eventually "sediment as habits" (ibid:222f). Even if individual choices are part of such making, Tin finds that "choosing to take up a tradition involves submitting to a certain set of rules" (ibid:225). However, the rules are not just followed, they are subject to interplay between different practitioners, and may therefore change (ibid:225)<sup>2</sup>. Tin concludes that the "main function of tradition is /.../ to provide a basis, a stepping stone for a new project" (ibid:222). Practitioners respect rules in their 'play', however the 'players' may also distinguish themselves as there is leeway (ibid:245f).

Now, there are significant differences between the constructing of common-tiebeam roofs long ago and the traditional making of handcrafted things in the present. One is that today, no carpenter has practiced in the 'common-tiebeam roof building tradition'. The tradition has been gone for centuries. Thus, living practitioners and later written evidence can only support the interpretations indirectly. Another is about the scale of the making. Creating the trusses was part of a big, complex and likely expensive project, which involved not just one maker, but also a number of people with other skills (cf. Mannoni & Giannichedda 2003:106 [fig 16]). The different 'players' in such a church building 'game', for example patrons, priests, master builders, masons and carpenters, were most likely all required, but they were not alike, and some were stronger than others in different situations and phases of the process. Thus the 'interplay' was perhaps rather a negotiation, and the 'players' did not take part on equal terms at all times.

The cluster of attics offers an unusually rich and nuanced, archaeological wooden material. The main idea of rules and leeway in traditional making is, as I interpret Tin, an 'iterative-creative play' (cf. Cornell & Hjertman 2013). This makes it possible to look for 'rules' and

‘models’ in the roof building projects which may have been followed, and ‘leeway’ in which skilled and creative team members [craftsmen as well as patrons or master builders], may have chosen not to copy models fully. I find that this view connects to the idea of seriality in micro-archaeology, as the making is iterated. The performed, [architectural] articulations, can be explored in both ‘rules’ as well as in equally important ‘leeway’. The approach provides a tool for analyses of articulations in the top of the box; I view these as performed activities.

### **3.1. COMMON-TIEBEAM ROOFS**

This part opens the discussion about the character of the top of the five nave-rooms. The-sub chapter cast light on wood materials in the five roofs, and thereafter relates their constructions to principles of the common-tiebeam type, and the distribution and chronology of such roofs. I introduce questions about the seemingly close spacing and large numbers of tiebeams in the five roofs, and explore further by linking them to a number of other, similar roofs in Västergötland, which Gullbrandsson presents in his catalogue (Gullbrandsson 2015).

#### **Wood materials**

Making the roofs started by felling suitable trees. Carpenters working in the first part of the twelfth century in north-west Europe probably had access to suitable wood qualities in many, though perhaps not all areas (e.g. Hoffsummer 2011:319). An account from the [Gothic style] remodelling of the west part of the Abbey Church in Saint Denise, France, which took place in the years 1135–1140, conveys that finding proper wood was in some cases precious. The famous patron and master builder in charge, Abbott Suger, worried about where he would find wood for the roof. He chose to take part in the search himself, and looking through the depths of the forest, Suger finally found the twelve beams he wanted (Panofsky 1946). Making common-tie-beam roofs requires particularly high numbers of good wood qualities especially for the many tiebeams. The question here is if Abbot Suger’s contemporaries in Västergötland, in essentially the same years [1134–1157], had access to proper wood qualities. What wood materials did the carpenters have access to and what did they choose to work with? Wood-materials in four of the five churches Forsby, Forshem, Gökhem and Marka, were analysed based on the samples taken for the dating (Seim et al 2015).

In Forsby, loggers went out to find trees for the church roof late in the year 1134 or early 1135 (Seim et al 2015:41ff). They felled timber for fourteen trusses over the nave. Each truss needed a particularly coarse, straight and long timber to span the room, the tiebeam. For this, they chose straight-grown pine-trees that must have been 35–40 cm thick about 11 m up towards the top. The selected pine-trees were of various ages, up to 150 years old. The two wall plates in Forsby are 10 m long and almost 40 cm wide. For one plate they chose a pine that was 112 years old, however, for the other, placed on the south wall, they chose an oak tree, which was 157 years old. Timber for rafters and struts were taken from likewise straight-grown, but much thinner pine trees of different ages. Loggers made similar choices in other



local forests, between the late summer of 1140 to the spring 1141 in Gökhem, and likewise in 1155 or 1156 in Marka (ibid). In Forshem [1131-1157] the builders chose to use oak timber for the entire roof structure over the nave, wall plates and thirteen trusses. They too selected straight-grown trees. Samples show that they used both old and young individuals; the oldest oaks may have been over 200 years (ibid:46). Most oak timbers do not have waney edges. This is almost only found on the rafters in the two outermost trusses, towards the west and east gables. There, the carpenters turned the waney edges towards the masonry, hidden from sight. This suggests that they only used waney edges if necessary, and further, that they did not have access to abundant supplies of proper oak wood.

The loggers agreed on when to fell the trees, i.e. in the season between the late summer and spring. They chose straight-grown pine or oak trees, which were close to the requested dimensions. The age of the chosen trees varies relatively much in relation to speed of growth, between 60–150 years for pine and up to over 200 years for oak (Seim et al 2015:47). This is similar to findings in Norway, where constructions in stave churches were made from both fast grown trees with few rings, and trees with slow grown numerous, narrow rings (Thun et al 2016:116). It indicates that narrow rings was not in itself a criterion for selection in Norway (ibid) and even if this issue needs to be taken further, perhaps not in Västergötland either. It is not investigated how far the timber may have been transported, from the forests to the building sites, however, the trees originate from local or regional, multi-aged, dense forests and were not transported over longer distances (Seim et al 2015:47). Clearly, the carpenters in mid-twelfth century Västergötland had access to a wide range of good wood qualities (ibid). Yet, carpenters in south Scandinavia may have seen a change in the forested landscape in this same period, as Bartholin (1978) notes a difference between the first and the second half of the twelfth century in the area around the town Lund, in south Sweden. He finds that builders felled construction timber in open landscapes and included much younger trees in the second half of the twelfth century (ibid). The examined and dated roofs over the subsequent chancels in Gökhem [after 1239] and Forshem [1269d] suggest a similar development in Västergötland. The oak trees used for these two roofs show higher growth rates, younger ages, and more individual growth patterns; likely open grown trees (Seim et al 2015:46).

### **The common-tiebeam truss form**

Most early surviving roofs have trusses of the structural type ‘common-tiebeam’. Early medieval carpenters raised such roofs in churches in the Rhineland, northern France and the Low Countries, “the heartland of the Carolingian and Holy Roman Empire”, as well as in Scandinavia (Courteney & Alcock 2015:163). Remarkably many, 130 out of 250 identified, more than anywhere else, occur in Sweden (ibid:137), and the five roofs in Västergötland are part of this large gathering. By contrast, common-tiebeam roofs hardly occur in England (ibid). Recent work on the earliest roofs suggest that the common-tiebeam form dominated in north-west Europe in the period around 1100 (ibid:124). In Västergötland, the

common-tiebeam roofs probably ruled for an even longer period. Dated structures suggest that carpenters made such roofs from the early twelfth – late thirteenth century (Gullbrands-son 2015).

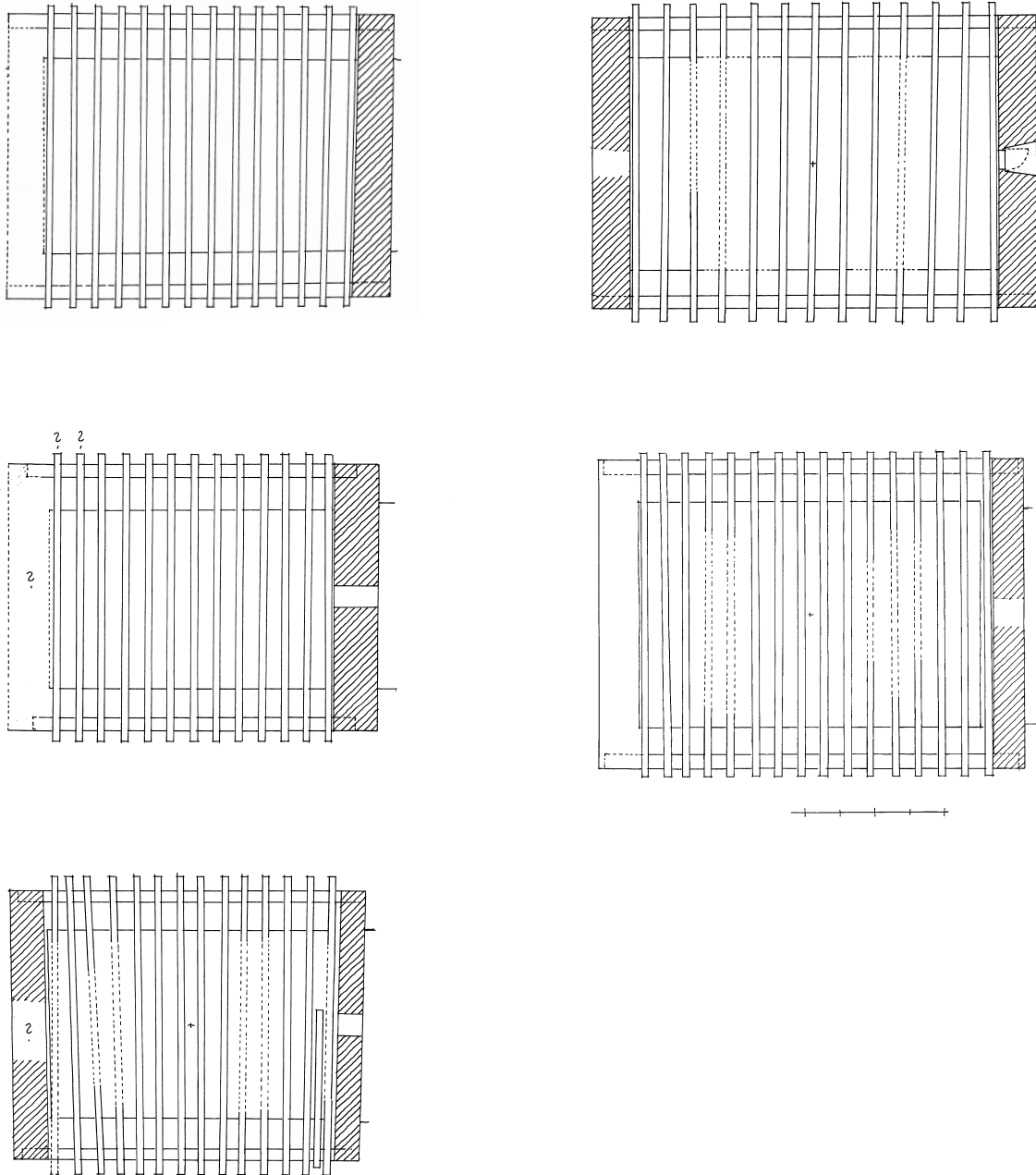
The carpenters shaped all trusses in the same common-tiebeam roof alike; except for, in some cases, the trusses placed next to the gables. These seem to have been a little simpler than the others are. All trusses have a horizontal, long and full ‘tiebeam’ at the base. Each tiebeam keeps a couple of rafters in place. This forms the basic triangle that makes the construction rigid. In four of the five roofs, Eriksberg, Forshem, Gökhem and Marka, the pitch centre around 45°. Only the roof in Forsby is steeper, around 52°. These slopes are the same or a little steeper than in other common-tiebeam roofs, Courteney & Alcock find that the pitches in their large material vary between 38° and 45° (Courteney & Alcock 2015:125). Inside the frame, various numbers of struts support the rafters. Courteney & Alcock identify a number of principal methods for such internal bracing (ibid:134–139)<sup>3</sup>. One variation concerns the use of either canted [type A] or vertical [type B] struts [with or without a collar], and they find that canted struts braced the earliest trusses in north-west Europe (ibid). The roof over the nave in Forshem, which have two canted struts and no collar, belongs to this earliest type. The trusses in the other five roofs, applies to the “lattice” [type C], which uses multiple canted struts forming diagonal cross bracing. The trusses in Forsby and Gökhem have six crossing struts. Eriksberg and Marka have four, which seem to be a common number in Västergötland, counting 20/32 in Gullbrandssons catalogue (2015). None of the five roofs has collars.

The lattice bracing occur almost only in Scandinavia, there is only one example in central France, in Chabris, Saint- Christophe (Courteney & Alcock 2015:134–139). Trusses braced by parallel rafters [type P] and scissor bracing [type S], also belong mainly to Scandinavia (ibid). However, examples of tiebeam trusses without any braces [type T], were raised in a number of places e.g. Sweden, Germany, England, even one in Greece (ibid). Courteney & Alcock propose a chronological sequence were canted struts [A], regionally give way to rafters braced by vertical [B], lattice [C] and those without struts [T] (ibid).

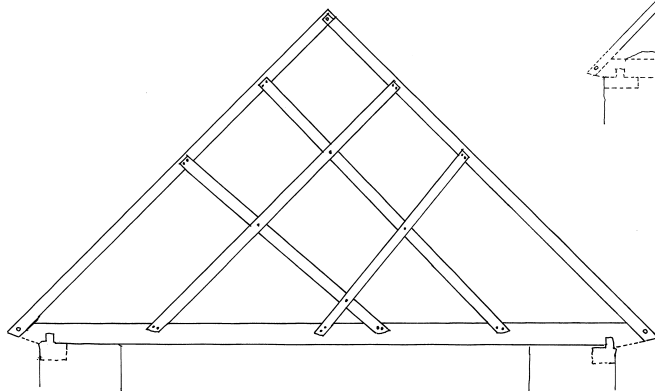
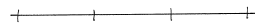
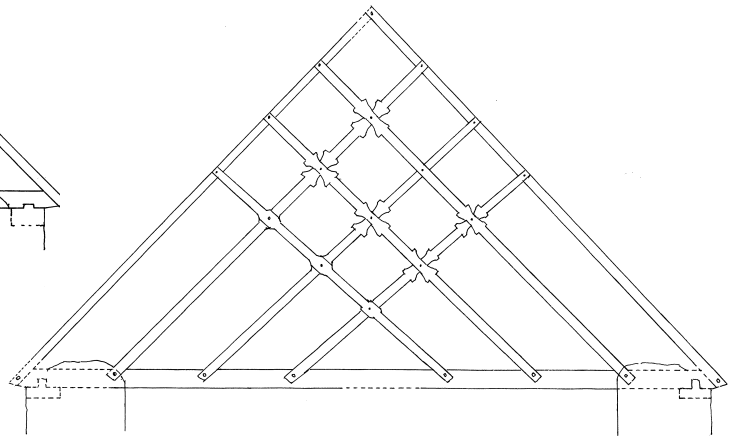
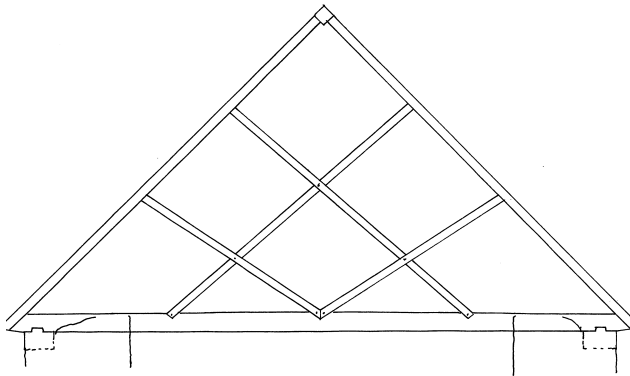
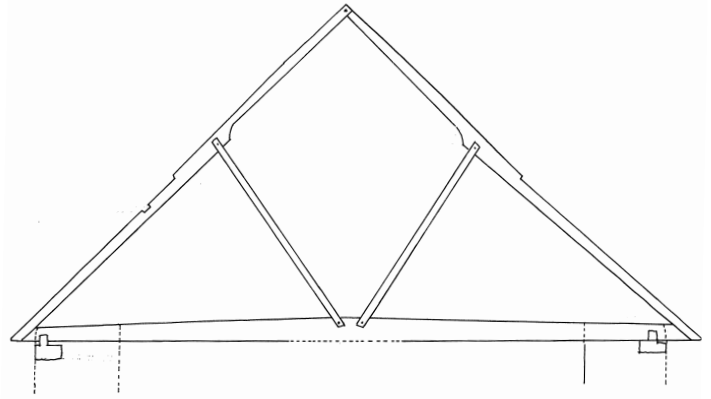
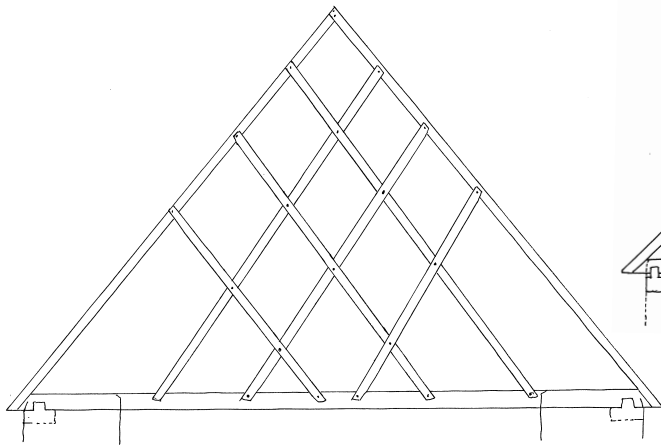
Four of the investigated roofs lack longitudinal stabilization, however, in Forshem there are traces from that the carpenters made a diagonal stabilization, which they felled into the top side of the rafters. The roofs largely have carpentry lap joints with straight blades, secured with large-headed iron nails or dowels with expanded heads, though there are some exceptions. Courteney & Alcock find the same in most of the earliest roofs, as carpenters used lap joints, either straight or with dovetail halving, generally secured with wooden dowels (Courteney & Alcock 2015:134). Notably, the timber showed no clear or systematic carpenter marks. This is similar to other early roofs in Sweden (Sjömar 1992, 1995) and Norway (Storsletten 2002). However, it contrasts practices in southwest Denmark where numbering systems, carved or chopped in to the wood, identify the sequence of trusses over an attic (Madsen 2013:4). Madsen finds that the practice in south Denmark correspond to roofs in Germany (ibid). The church building teams in mid-twelfth century Västergötland chose to shape their nave-roofs in a way that has many of the characteristics of the common-tiebeam form. However, within this general pattern there are differences, variation.



**Fig. 3.1.** The five attics. **Above left**, Forsby. Photo 2011 Eriksson. **Above middle**, Forshem. Photo 2013. **Above right**, Gamla Eriksberg. Photo 2013. **Below left**, Marka Photo 2013. **Below right**, Gökhem. Photo 1967 Klasson, ATA.



**Fig. 3.2.** Plans of the five attics with tiebeams, wall plates and wall crests. **Above left** Forsby, and **above right** Forshem. **Below left** Gamla Eriksberg, and **below right** Gökhem. **Underneath** Marka. North is up in all plans.



**Fig. 3.3.** Examples of the five truss types, cross-sections. **Above left** Forsby, and **above right** Forshem. **Below left** Gamla Eriksberg, and **below right** Gökhem. **Underneath** Marka.

### Tiebeams in large numbers

Working to cover the five naves carpenters shaped all trusses in the same roof alike, every one including a tiebeam, two rafters and various struts. The internal spans vary from a little more than 5 m in Gamla Eriksberg to 6.5 m in Gökhem. These are modest distances compared to for example the internal span of c. 10.4 m in the abbey church of Notre-Dame de Jumièges, in France, which probably had similar trusses (Courteney & Alcock 2015:132). The spacing of the trusses varies between 0.80–0.85 m [center to center] in Forshem, and only 60–70 cm in Eriksberg, Forsby, Gökhem and Marka. Courteney & Alcock finds that the spacing in their large material varies between 0.47–1.65 m [c-c] and that 0.90 m is the median value (ibid:158). Thus, the spacing in Forshem is near the median value, but the tiebeams over the five other roofs are more closely spaced.

The carpenters notably attached all rafters in one structure to a tiebeam. All kinds of roofs require a suitable number of rafters. However, compared to other types, common-tiebeam structures have unusually many tiebeams. To explore this further, I compare the lengths of the five nave-rooms and the actual numbers of trusses in the five roofs, with sixteen other similar common-tiebeam roofs in Västergötland. The investigation builds on plan layouts [in scale 1:100] in the catalogue by Gullbrandsson (2015). The drawings makes it possible to figure the size of the nave-rooms below approximately. I chose these sixteen roofs because they cover over nave-rooms that are about the same sizes as the five, and because Gullbrandsson interprets, they have a full set of trusses. Dendrochronology has dated eight of the sixteen roofs to the twelfth- or first part of the thirteenth century.

A first question is if there is, as would be expected, a relationship between how long the rooms are and the number of trusses? The lengths of the 21 [5 + 16] naves ranges between the shortest, Mularp 6.4 m, and the longest, Skalunda 10.6 m, and the number of trusses that the builders chose to erect vary quite much, between 9 and 20 trusses. The examination shows that the various number of trusses in the 21 roofs do not correlate well to the actual length of the rooms they cover over, i.e. the c-c spacing vary. One example is that the same number; twelve trusses, cover both the shortest and the longest of the nave-rooms. Even if the carpenters put the largest number of trusses, 20 in Jäla, and 19 in Kärårakra, over rooms that are relatively long, 9–10 m, the many trusses were in fact crammed. The spacing's are only 0.48–0.50 m. The roof over the naves in Skalunda and Forshem sticks out, as the distances between their 12 respectively, 13 trusses are the greatest, with a c-c spacing about 0.85–0.9 m, thus being close to the median found by Courteney & Alcock. The preferred number of trusses over a nave, among the 21, is clearly 13. This is the case in eight churches, and the roofs in Forshem, Marka and possibly Gamla Eriksberg, belong to this group.

I find that the c-c spacing of trusses in the 21 roofs is quite a bit closer than in the larger stock, which Courteney & Alcock investigated. All but two of the 21 church building teams in Västergötland chose to put relatively many trusses over their naves. The two are close to the median value. Further, there is no obvious correlation between the nave-rooms' lengths and the number of trusses, and the actual number of trusses that cover a nave-room may vary

Church nave	width m	length m	nr trusses	date
Jällby [wood]	4.7	6.6	9	
Mularp	4.6	6.4	12	
Skalunda	6.4	10.6	12	1148d
Valtorp	5.6	7.2	13	
Marum	6	7.6	13	1140d
<b>Gamla Eriksberg</b>	<b>5.1</b>	<b>8</b>	<b>13?</b>	<b>1153d</b>
Fivlered	5.7	8	13	
Söne	5.7	8	13	
<b>Marka</b>	<b>5.4</b>	<b>8-8.2</b>	<b>13</b>	<b>1156d</b>
Kinne-vedum	6	8.7	13	1188d
Fullösa	6.1	8.7	13	1205d
<b>Forshem</b>	<b>6.1</b>	<b>10.5</b>	<b>13</b>	<b>1131-57d</b>
Mjälldrunga	6.6	8.2	14	1201d
<b>Forsby</b>	<b>5.5</b>	<b>8.8</b>	<b>14</b>	<b>1134d</b>
Knätte	6.9	10.2	14	
Suntak	5.7	8.4	15	1138d
Edåsa	5	9.3	16	
<b>Gökhem</b>	<b>6.5</b>	<b>9.7</b>	<b>16</b>	<b>1140d</b>
Ornunga	7	9.7	16	1247e
Kärråkra	6.2	9.2	19	1211d
Jäla	5.8	10	20	

**Fig. 3.4.** List of 21 church-naves in Västergötland from Gullbrandsson's catalogue, including my recordings of the five roofs, sorted by number of trusses and length of the nave room. The measures are approximate.

quite much [9–20]. However, 13 trusses sticks out as the preferred number, implemented in eight out of the 21 building projects.

### 3.2. 'GATES' AS IN BARNs

This part seeks to understand the significance of the relatively large number of tiebeams in the five roofs. First, I search for alternative roof structures, perhaps with fewer tiebeams, which may also have been available as role models at the time. Thereafter I propose that there was a connection to wooden building practices, with the wording in the Older Västgöta law, 'standing posts attached to [wall] plates' in mind, I examine the intersection between tiebeam and wall plates. Focus is on Gökhem and Forshem churches, as these roofs are probably still in situ.

### Alternatives: principle and secondary trusses

Hoffsummer identifies about a dozen roofs in churches, raised in the first half or mid-twelfth century in France, with principle and secondary trusses (Hoffsummer 2011:323). The earliest of these covers the nave in the church Saint-Maurice à Chinon (Indre-et-Loire), dated to the year 1128 (ibid [fig. p. 91]). This means that even if common-tiebeam roofs dominated, there were alternatives. The carpenters in France had colleagues in west-Norway who also raised alternative roof structures. Storsletten (2002) describes the roof in the stave church Urnes, dated to the year 1131 (Thun et al 2016). Here the builders chose to make the roof over the nave with four principal trusses and rafters alternately (Storsletten 2002a:193; fig. in Christie 2009:22). The spacing of the trusses is about 1.3 m c-c, and the rafters in between are supported by longitudinal purlins (Storsletten 2002a:194). The trusses do in fact not have a tiebeam at all, but instead scissor bracing and collars. The roof over the nave in the nearby Hopperstad stave church, dated to the year 1132 (Thun et al 2016), is almost the same. It has alternately trusses and rafters. The spacing of the trusses is about 1.4 m (ibid:229).

How do the church roofs, placed on solid masonry walls, relate to contemporary vernacular roofs, placed on various timber frame or arcade post constructions? No such roof has survived from the mid-twelfth century. Though, Madsen (2007, 2013), compares common-tiebeam church roofs [the Roager and Arrild types] in the area around Ribe in south Denmark, with an excavated farmhouse in North Schleswig dated to the twelfth century (Madsen 2013:11 [Fig. 9], 2007:50f [Fig. 24]). He suggests that the early medieval [church] carpentry in this area could well be connected to the vernacular, wooden building practices in the region, as these, judging from the archaeological evidence, were equally complex (Madsen 2013:7ff; 2007:49). Madsen argues that the situation, raising a roof on top of [church] masonry walls was comparable to putting a roof on top of a [vernacular] timber frame with head plates [*højrem*] (ibid). He points out that once the head plate was in place, the carpenters were free to make the roof constructions in various ways, as it is possible to place rafters on top of the plates without direct correspondence to the wall frame below (ibid). Madsen concludes that the local carpenters were skilled enough to construct roofs in churches, and that they may have carried out both church- and vernacular roof constructions. (Madsen 2007:50).

Epaud examines the standing barn Grange du Val-de-la-Haye, Seine-Maritime, in Normandy, dated 1216–1220 (Epaud 2011:261–267). The main wooden structure has three parallel pairs of posts put on stones directly on the ground. The internal span between the posts is about 6 m. This is similar to the internal span between the walls in Forshem and Gökhem. The builders put a longitudinal arcade plate [*sablière*] on top of the posts. The carpenters put the plates on the outside of the larger post's tops. Thereafter they put the tiebeams across and thus, the tiebeams overlap the arcade plates [Fig. 3.5].

Braces between the tiebeam and the posts makes the gate-structure rigid. The size of the three key tiebeams in Val-de-la-Haye [31 cm across by 36 cm high], are not far from the tiebeams in for example Gökhem [25 cm across by 27 cm high]. However, in Val-de-la-Haye they are spaced about 6 m apart, compared to the between 0.6–0.7 m in Gökhem.



Photographer Malcolm Kirk (1994:129) pictured the interior of Grange du Val-de-la-Haye and in his cross section view, the pair of posts connected with the tiebeam, looks quite like a giant gate.

The carpenters in Val-de-la-Haye then placed the roof structure on top of the arcade plates. The roof covers over a long room, almost 30 m between the masonry gables. The structure has two sets of trusses [*fermes*], principal and secondary. They placed the principal trusses over the paired posts [the 'gates'] as well as next to the masonry gables. The secondary trusses carry purlins [*pannes*], which in their turn support the large number of rafters [*chevrons*].

Other, later timber structures may also point to early medieval wooden building practices. Stornes (2004) compares another large barn in Normandy, the Grange d'Heurteauville, dated to the 1230s (ibid:88), to vernacular trestle-framed [*grindbygg*] barns in Norway. He finds that the wooden structure in the barn in Grange d'Heurteauville was put together in the same way as barns in Norway. The main element in the construction is the 'gate' [*grind*]. This is formed by a pair of posts [*stavar*] joined at the top by a horizontal tiebeam [*bete*]. Notches [*stavorer*] at the top end of the posts, and braces, secure the gate. The builders place the longitudinal plates [*stavlegjer*] on top of the tiebeams after having raised the gates (Stornes 2004:85-89; Christi 1998:112; Roede 1998:120; ). Hence, the trestle-framed barns too have longitudinal plates that support the roof, and it is possible to put various independent kinds of truss and/or rafter structures on top. The suitable dimension of the plates depends of course on the distance between the gates. As in the two examples from Normandy, the 'grind' barns in Norway have no sill; the builders put posts on flat stones directly on the ground. Thus it is assumed that the older vernacular 'long houses' in Norway were built in this or a similar way, even if the oldest identified trestle-framed barn dates much later, to the 1550s (Stornes 2004:89).

The few surviving early church roofs with principle and secondary trusses show that there were in fact alternative roof structure role models available at least from the 1130s, in both France, the 'heartland', and far north in the outskirts, in Norway. Some carpenters in these areas were accustomed to the idea to separate principal and secondary structures in a roof, and in these, the carpenters separated tiebeams and rafters, and they used tiebeams more sparsely. The idea and skill to make constructions that used fewer tiebeams in a roof may therefore have been at hand also for church building teams in mid-twelfth century Västergötland, yet, the remarkably large number of tiebeams in the roofs in Västergötland clearly demonstrates what was preferred.

What about wall plates in the five churches? How did the builders put them up on the masonry church walls? Further, how do the tiebeams meet the wall plates? To explore, my focus zooms in to the shapes of the wall plates and tiebeams in the five churches. My argument is that to understand the architectural significance of the many tiebeams, these two key parts, form a critical joint. I examine the shape and forms of the two parts respectively, and then their intersection.

### Close up: separating the tiebeam's two tasks

All ten wall plates in the five naves are largely preserved, even if parts of them are missing or in bad shape. However, the plates are not easily accessible as the masons covered them more or less completely with stone and mortar. They are therefore mainly possible to observe in places where the top of the masonry has been removed or damaged.

The builders put only one wall plate on top of each wall. They placed it towards the outer edge of the more than 1 m thick masonry walls. The plates were likely continuous from gable to gable. It is not possible to measure the precise total length in all cases, as the plates continue in under the masonry gables, or in some cases are damaged and partly missing. They range between c. 9.5 m [Gamla Eriksberg and Marka] c. 10.5 m [Forsby], 11.5 m [Gökhem] and 12.5 m [Forshem]. The plates in the five churches are big timbers, in Gökhem for example, they measure 35–41 cm across and are 22–25 cm high. The logs probably have slightly differing dimensions at the top and root end. The cross sections reveal well thought out and complex forms, which the carpenters skilfully and precisely carried out. The upper side of all investigated plates has a threshold, i.e. they are 'cogged' (cf. Courteney & Alcock 2015:131). However, all thresholds have slightly different forms. The carpenters in Gökhem and Forshem shaped the wall plates almost like planks at the bottom, with a high central prominent cog on top. The cross section forms an upside-down 'T'. They are about the same size in Gökhem and Forshem. The carpenters made notches distributed over the length of the wall plates designed for the tiebeams to fit across, e.g. 13 in Forshem and 16 in Gökhem. Thus the tiebeams were to be somewhat, but not entirely halved over [Fig. 3.5].

I have compared the wall plates in the five churches, to other wall plates in early tiebeam roofs in other regions, by looking at recordings, i.e. drawings showing cross sections. The upside-down 'T' shape occurs in a few drawings. Madsen presents drawings of Kalvslund (2013:14; 2007:112–115) [nave] and Randerup (2007:154) [chancel] churches, in Denmark, which are quite similar to the ones in Forshem and Gökhem. These seem to have wall plates with a distinct upside-down 'T' shape, placed at the outside edge of the masonry wall. The holes for wall plates observed in the masonry of the abbey in Jumièges also resemble the ones in Forshem and Gökhem, however the abbey's plates were probably even broader, as the holes measure 52 cm across (Courteney & Alcock 2015:131). Wall plates in other European roofs are different. Among the cross sections in Hoffsummer (2002) which show existing roofs, I only find two [not rebuilt] that have wall plates placed in a more or less similar position in relation to the tiebeam. It is the church Saint-Barthelémy, in Liege [dated 1141–1151, 1187–1188], and the church Saint-Pierre-de-Montmartre, in Paris [dated 1164–1174] (*ibid*:166ff [pl.1e; pl. 2a]). However, in contrast to the five churches, the builders in Paris and Liege shaped rectangular plates and did not put them at the outer edge of the masonry. Storsletten's catalogue (Storsletten 2002b) show that the twelfth century masonry churches in Norway are different too, as they have two rectangular wall plates on each wall, e.g. Vaernes church (Storsletten 2002b:256–261; Storsletten 2016:242–257). Other Norwegian roofs, searching for the mid-twelfth century period, cover stave churches, i.e. timber frames with head plates.

Finally, the drawings in Gullbrandsson's survey of roofs in Västergötland show that the wall plates in perhaps as many as 30 churches have a similar, cogged shape. This puts forward that making wall plates with thresholds and placing this in the outer edge on top of the masonry walls, was a well-established practice in Västergötland.

Many tiebeams in the five churches are preserved. Parts of them are missing in Forshem, Gökhem and Marka, as builders later simply cut them off to create space for subsequent vaults. The tiebeams in Forshem and Gökhem are particularly accessible as the vaults created space underneath. However, the masons originally covered the tiebeams and wall plates with stone and mortar, making a 'package'. Thus in Gökhem the tiebeam are mainly possible to observe in places where the top of the masonry was removed or damaged. In Forshem, they are accessible as the original masonry 'package' is preserved in only a few places.

The internal span between the [north and south] masonry walls varies from c. 5.1 m Gamla Eriksberg [which should perhaps not be included], 5.5 m Marka, Forsby, 6.1 m Forshem, to 6.5 m Gökhem. However, the distance the tiebeams in fact cover, between the wall plates, is slightly longer, from c. 6.9 in Gamla Eriksberg to 8 m in Gökhem. The tiebeams stick out past the outside of the walls, i.e. they over-sail the wall plates by about 30–45 cm on both sides. Altogether, the total length of the tiebeams in the masonry churches accounts to between 8–9 m. The carpenters made the tiebeams from straight grown trees, of oak in Forshem, but in all the others of pine.

The beams vary however, measure about 25–27 cm across and are c. 28–30 cm high. They have slightly differing dimensions at the top and root end, though this is so little that it is in many cases difficult to measure safely. The carpenters made the bottom side, which faced the room below, straight. The upper side, on the other hand, seemingly shaped slightly curved. This is hard to measure, but occur at least in Forshem and probably also so in Gökhem. Thus, the upper side forms an about only 2.5 cm high arch. Further, they shaped the beams' sides slightly curved, which means that the beams are generally a little thinner towards the ends and thicker in the middle. Finally, the carpenters shaped the ends of the tiebeams, the part that over-sail the walls, in a complex and elegant form. Each tiebeam was given a front- and backside, as the carpenters made notches for the thin rafters and struts, towards the same side in the upper part of the beam. The tiebeams in Gamla Eriksberg do not all follow this pattern.

The builders placed the tiebeams over the cogs in the wall plates. In Forshem they fitted each beam into an individual notch in the cogs. This set of tiebeams and two wall plates visually holds the top of the walls together. Finally, after the tiebeams were all in place, the masons continued the walls up to cover both wall plate and tiebeam with stone and mortar, creating a neat package around the joint timbers. The wall plates outer sides were visible and the wooden surface may have been decorated. Traces of decorative carvings remain e.g. in the nearby Ornunga church and in Kumlabý church, Visingsö, an island in the lake Vättern.

### Intersection in a package forms gates

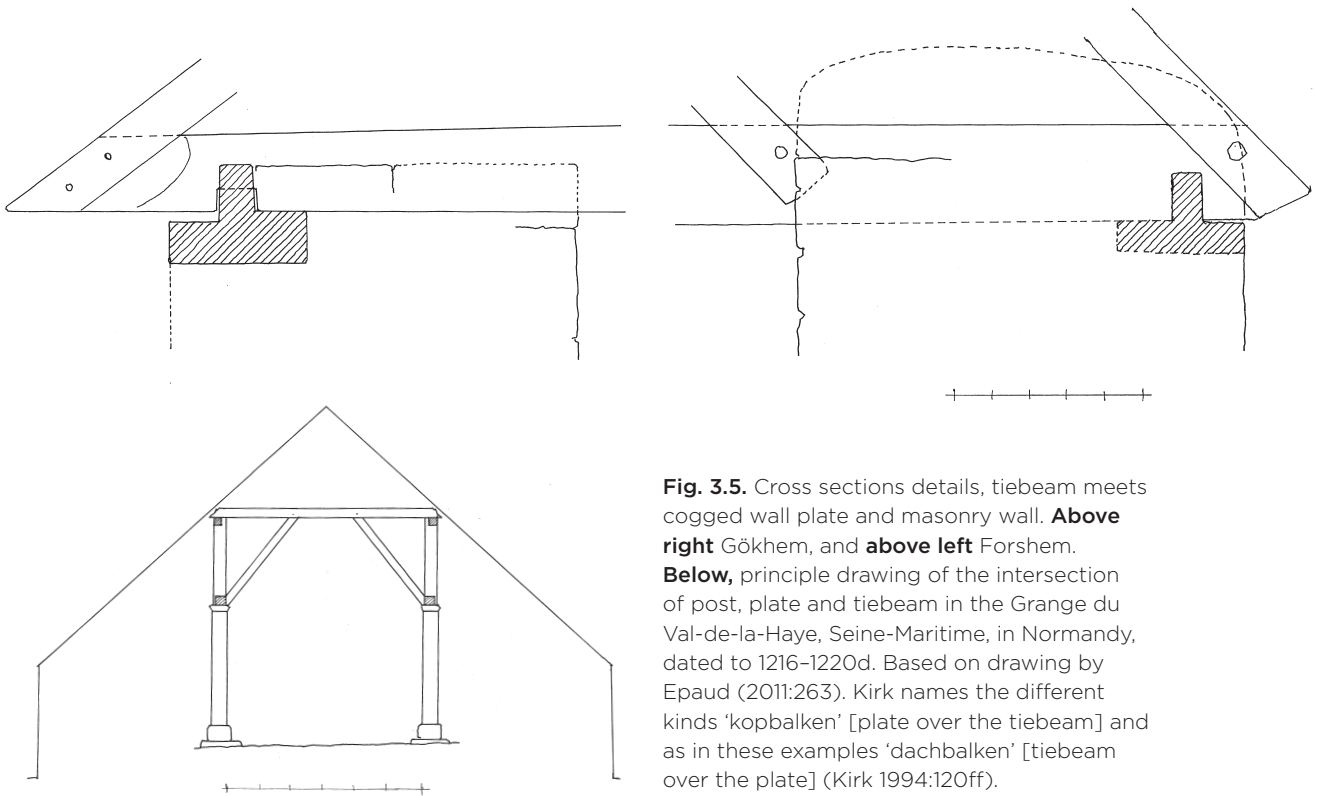
The comparison between the twelfth century church roofs in Västergötland and alternative types of church roofs from the same time shows that other builders separated the different elements into principal and secondary parts. Moreover, this separation occur in surviving thirteenth century vernacular wooden buildings. In these alternatives, builders used tiebeams more sparsely. In this context, it may indeed seem a strange thought to have a tiebeam attached to every couple of rafters. However, this was undoubtedly a 'rule' in the church-nave-roof-building game, in mid-twelfth century Västergötland.

The close examination of wall plates and tiebeams show that the builders placed only one wall plate on top of each wall, towards the outer edge of the masonry. Both the wall plates and tiebeams have complex forms, which the carpenters skilfully and precisely carried out. The wall plates all have a threshold, and some may have have notches where they were to fit with the tiebeams. Finally, the builders placed the tiebeams across the wall plates and thereafter masons created a package of stone and mortar around the joints, which made the intersection at least visually rigid.

This combination of the three parts: top of the wall, wall plate, and tiebeam, is different from other contemporary common-tiebeam church roofs. In France, builders placed e.g. a single wall plate over the masonry crest and in the middle of the thickness. In for example Norway, builders put two wall plates on each wall. The cogged shape is characteristic for the churches in Västergötland, though two examples in Denmark and the trace in Jumièges suggest that carpenters elsewhere also shaped wall plates with cogs. The combination of 'wall plate at the outer edge of the wall crest and tiebeam across' rather connects to 'head plate on the outer edge of heavy posts and tiebeam across' in surviving vernacular wooden barns. Two barns in Normandy provide examples of different solutions in this joint. The joint in the five roofs is similar to one of these.

Storsletten, writing about the Norwegian early roofs, points out that trusses in principle forms a rigid triangular framework (Storsletten 2002a:10). The triangular design in such a framework support loads [tensile and compression], and the tiebeam, in a common-tiebeam truss, is an important part of such a triangular structure. However, Thelin (2006) clarifies that even though the [common-tiebeam] truss has inner support by means of the tiebeam, its base, the wall plate, also play an important role. He shows how the tiebeam and wall plate, in the example Torpa church in Sweden work together, to transfer the load (Thelin 2006:11–16).

The combination of tiebeam, rafters and struts in the five roofs obviously forms triangular, more or less unbending trusses. These are important parts of the structure. However, I argue that the triangular framework is just one notion that a tiebeam in the five naves is part of. The tiebeams do not only belong to the trusses, they are also part of another combination of three key parts, the top of the solid wall, wall plate and tiebeam. When the masons wrapped these parts in with stones and mortar, carefully forming a neat package, they made this intersection important and at least visibly rigid. As the tiebeams are part of both these structures, I conclude that each tiebeam has two tasks. On the one hand, it constitutes a



**Fig. 3.5.** Cross sections details, tiebeam meets cogged wall plate and masonry wall. **Above right** Gökhem, and **above left** Forshem. **Below**, principle drawing of the intersection of post, plate and tiebeam in the Grange du Val-de-la-Haye, Seine-Maritime, in Normandy, dated to 1216-1220d. Based on drawing by Epaud (2011:263). Kirk names the different kinds 'kopbalken' [plate over the tiebeam] and as in these examples 'dachbalken' [tiebeam over the plate] (Kirk 1994:120ff).

firm base for the triangular top above. On the other hand, each tiebeam establishes the *top* of paired walls with plates. This is an arch-like structure, an 'upside down U', and this, I suggest, may be an important architectural element.

Even if the builders placed the tiebeams and head- or arcade plates differently in relation to each other, in the two example thirteenth century barns in Normandy, they both structurally and visually formed something of the same, arches, or 'gates' in the interiors. I like to call these gates, inspired by the in my view, so very telling name in Norwegian for 'trestle frame' [*grindbygg*], which views the structure as a set of 'gates'. Hence, I view the large number of tiebeams as the top of many gates, in tandem with, the bottom of many trusses. A gate is a strong architectural concept. It is an important part of defined boundaries, the opening between 'this side and that side', or 'here and there'. A gate is a passage or entrance, and if you go through it, there is a 'before and after'. The word 'gate' relates to 'gata' in Swedish and 'gasse' in German, i.e. a lane or a street, and thus suggests moving along.

Perhaps people built merely large numbers of, 'gates' in the naves in twelfth century Västergötland. Yet, as there is no obvious correlation between the nave-rooms' lengths and the number of gates, this is not certain. The numbers and spacing vary, and seen as gates [openings between this and that, offering a before and after], the individual gates as well

as the sequence of numbers over a room, may have had meanings that are more specific. Further, as the builders shaped the gates so firm, a lot of leeway is possible over the tiebeam. It is not like in a perfect Gothic truss where every part has a specific load-carrying task, figured out in advance. The carpenters in mid-twelfth century Västergötland theoretically only needed to put two struts right, as in Forshem, to support the sloping rafters. The others do carry, but they are perhaps just as much at play.

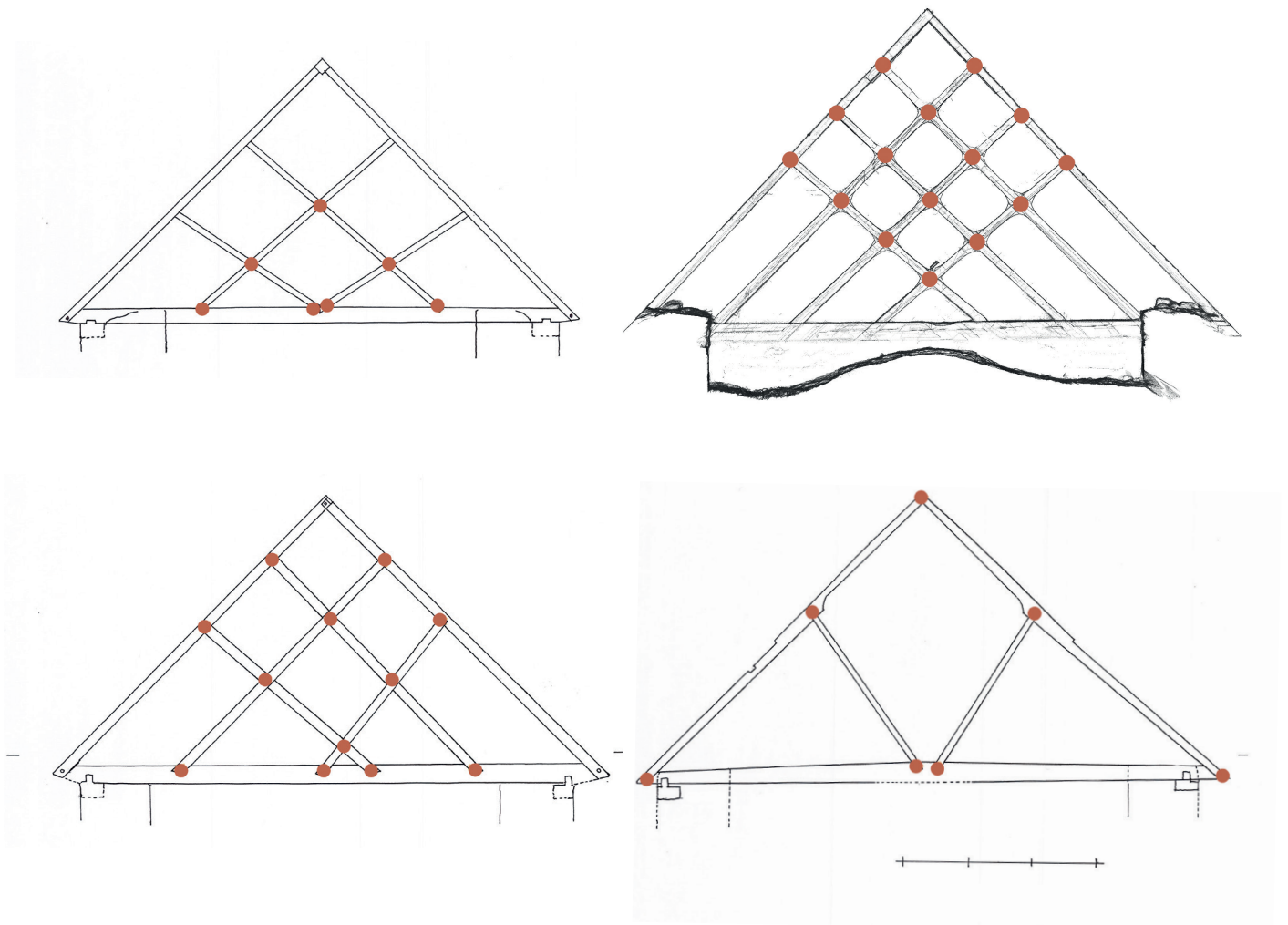
The word ‘truss’, which means a framework typically consisting of rafters, posts and struts, has an origin from Old French ‘trusse’ [noun] and ‘trusser’, meaning “pack up” or “bind in”, based on Latin for ‘twisted’ (Oxford). I propose that this broader understanding, ‘things packed up and bound together’, fits the structures in the five church attics better. In the next part [3.3], I will explore this line of thoughts by examining how the carpenters bound the rafters and various struts together, over the tiebeams.

### 3.3. LIVELY ARCHITECTURE

In this subchapter, I propose that the roofs were not designed as mere roof-carriers, but instead to be both pleasing to the eye, and active parts of the architecture. Thus, the attention shifts to the architecture of the top, its aesthetics and symbolic functionality. The purpose is to explore the questions about the roofs further, by breaking them into specific topics. First, I explore the question about characteristic features by focusing on three different themes; 1) the various shapes that the struts form in the five roofs, 2) the sense of flowing and billowing, and 3) the articulations in the roof in Gökhem. Moreover, trying to take the question about connections between the roof and the room below further, I explore how different parts and forms in the roof in Gökhem are oriented and placed, i.e. how the structure relates to the four capital points, and how the builders marked particular places in the roofs.

New mapping tools, scans of the complete church in Gökhem, has moved the search. The multitude of information in the point-cloud makes it possible to pose new questions. Most importantly, it is possible to examine the precise shapes of the sixteen tiebeams and every rafter and strut, from more or less all sides, together and individually. The scan also relates the roof accurately to the vaults and the room below. Yet, the scan-version cannot entirely replace myself being in the attic. The scan is not sharp enough to show essential small details. Nor does it show parts hidden under masonry or dirt. Therefore, a large part of the analyses still builds on evidence created by ‘handmade’, analogue investigations.

My main guide through this inquiry into forms and symbols is art historian Ernst Gombrich. In the introduction to his study in the psychology of decorative art, ‘The sense of order’, Gombrich (2012 [1979]) underlines [with Karl Popper], that perceiving is an active process (ibid:4). He finds that we actively scan the environment, we make a cognitive map “on which meaningful objects can be plotted” (ibid). Gombrich points out that we search the environment for regularities, which he believes is guided by an inbuilt sense of order (ibid:5). Hence, we look for patterns; however, we do so in different ways. Gombrich takes flat stones in a pavement as an example. If all stones are square, identical, and put out in straight rows,



**Fig. 3.6.** View of examples of trusses with fan-shaped crossing struts, and iron nails marked with red dots. Views from the front sides. **Above left** Gamla Eriksberg, and **above right** Gökhem. **Below left** Marka, and **below right** Forshem. Forsby has only wooden dowels.

the monotony soon bores us, and Gombrich argues that this is because the pattern can be understood too easily (ibid:8f). If by contrast, the pavement is composed of irregular slabs, as in 'crazy' paving, this presents a variety so great that we could never fully interpret it (ibid). On the one hand, monotony makes it difficult to attend as "the arrangement sinks below the threshold of our awareness" and on the other, a flood of novelty makes us give up (ibid). The crossing or canted struts in the five attics include very simple, apart from the rafters in Forshem and the most struts in Gökhem, only straight parts. What did the builders shape with their straight struts? Plain roof-carriers? Alternatively, did they create something which was also, with Gombrich, delightful and pleasing to the eye, and if so how?

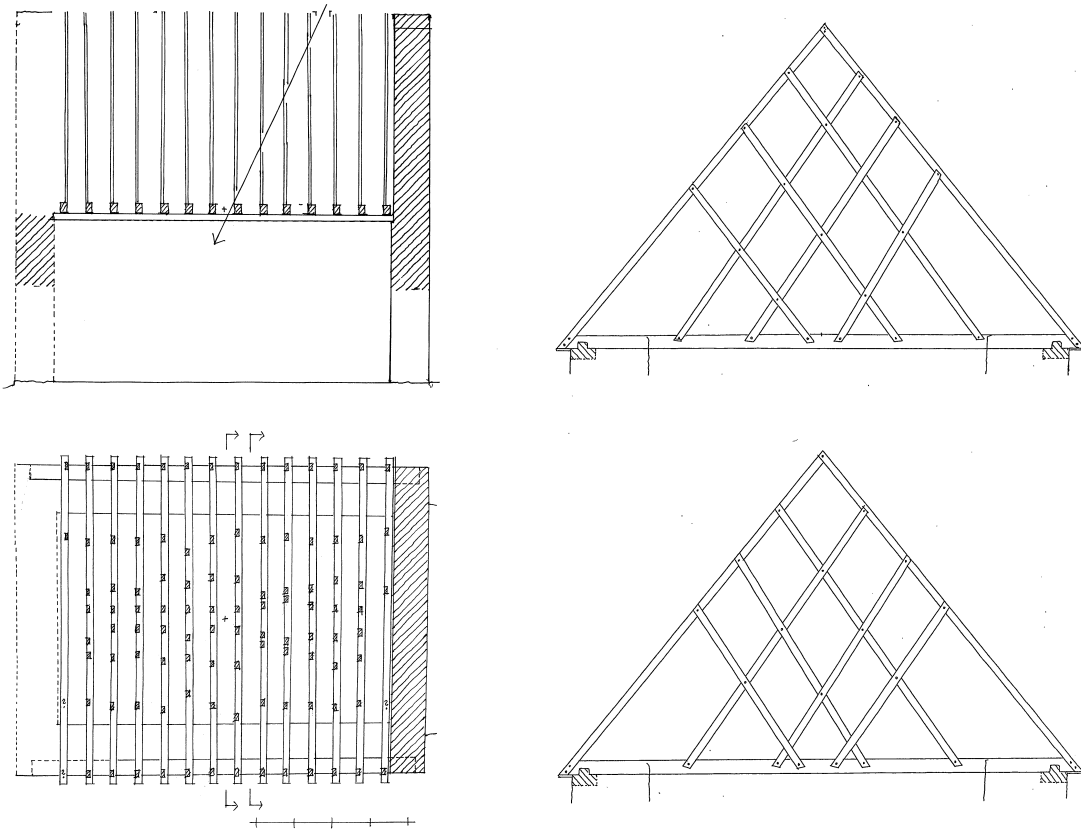
### **Crossed lines forms rhomboids again and again**

Gombrich continues, arguing that 'delight' in an aesthetic experience [e.g. of patterns] lies "somewhere between boredom and confusion" (Gombrich 2012:9). He puts forth that patterns with hierarchies, where units are grouped to form larger units, which in their turn can fit into even larger wholes, are possible to experience and master as we can concentrate on one thing at a time. Such patterns and articulations allow us to experience without being bored, to enjoy the unity in complexity. Gombrich finds that both unity and variation is important, and that 'variatio delectat', variation delights (ibid).

The struts form 'rhomboid' shapes in each of the five roofs. However, they are not identical as each building team chose to assemble different numbers of struts in a variety of ways. None of the teams distributed their struts evenly; they did not make a uniform grid in the triangle. Instead, they concentrated the struts towards and around the middle. In four projects, the building teams decided on crossing struts. In Forsby and Gökhem, the carpenters worked with six in each truss. In Eriksberg and Marka, the carpenters used only four crossing struts in each truss. The carpenters in Gökhem distributed all six struts on the stretch of the tiebeam that was visible from below, between the insides of the walls. They formed nine more or less regular, almost square, rhomboids at the top of the triangle. In Forsby, they also placed their six struts over the middle, but the lattice is not so high up towards the ridge. By this, they created irregular, rectangular rhomboids. They did not make an even grid. In Marka, the struts form four more or less even and same size rhomboids in the middle, and in Eriksberg, they formed four uneven rhomboids in the centre/top. In Forshem, the building team had something completely different in mind with their two struts. The carpenters made the inner side of the rafters curved and thereby highlighted the place where they attached the two straight and slender struts. Further, they attached the struts very close together at the bottom, on to the tiebeam. In doing this, one giant and elegantly curved rhomboid took form inside the rafter-tiebeam triangle.

The carpenters placed the crossing struts in the four churches Eriksberg, Forsby, Gökhem and Marka at slightly different angles within their triangles. They did not place them completely in line- or at a right angle with the rafters. In fact, all struts have a somewhat, not much but still, altered angle. They did not put the struts in randomly. Instead, the carpenters





**Fig 3.7.** Above left longitudinal section in Forsby, the view from south shows the tunnel at an angle. Below left plan over the roof in Forsby the cut is taken just over the tiebeams, and includes how the struts land on the top of the tiebeam. Right above and right below views of two of the shifted trusses in Forsby, which form the tunnel at an angle.

gave the whole lattice-grid a slight ‘fan’ shape. This gives the structure a sense of vigorous and organic strength. It grows upwards. All trusses in each of these four lattice roofs has this form. Even if they differ, they are within the limits of a fan shape form.

All joints in the roof in Forshem [two canted struts], were sealed with iron nails. In the other four roofs [four or six crossing struts], the carpenters mixed with wooden dowels. They mainly secured the outer triangle in the trusses with wooden dowels, i.e. the coupled rafters and the connection between the rafters and the tiebeam at the eaves. However, they locked rafter/strut and strut/strut intersections with iron nails instead of dowels. The iron nails are long and have very large heads about the size of a wooden dowel. These gatherings of joints-with-nails in the triangle with otherwise wooden dowels, creates a new form within the

forms, in for example Gökhem, it shapes a larger ‘diamond’, which is made up by the smaller rhomboids, and marked by the set of large nails. The iron material itself may well have had a symbolic meaning (cf. Karlsson 1988). In Gökhem, they shaped a similar large diamond in iron, in all trusses in the roof. This is likely the same in all the four roofs. However, it is not always easy to determine if it is in fact an iron nail or a wooden dowel in a joint, as their heads are made alike and of the same size. The best way to determine is to look at the trusses backsides, were the carpenters bent the nail to secure the joint. Another way is to touch them, as the difference in surface and temperature is obvious. Thus, it was possible to settle that what looks like two iron nails in a truss [15] in Gökhem, was in fact ‘nails’ made in wood. It suggests that iron nails were not always available in abundant supplies, yet perhaps more likely, they made it this way with intent.

As the trusses are see-through structures, the struts form horizontal [rhomboid] ‘tunnels’ in a longitudinal view. In Forsby, the builders clearly took advantage of this opportunity as they created a rhomboid-shaped tunnel at an angle [fig. 3.7]. They simply shifted the struts in three trusses somewhat, starting by the ridge [east], and landing at the bottom by a tiebeam [west]. This shifting of struts is visible in the plan layout drawing as the struts land differently on the tie beams, and carpenter Bygdén noticed the tunnel as he was climbing a ladder to inspect the ridge in 2011, looking down through the trusses. Moreover, as noted in chapter two, the tunnel ends at the ridge a few trusses from the gable. It is possible that the roof had an opening there, a ‘wind-eye’.

Summing this first part about characteristic features up, I find that none of the teams made a uniform, straight grid in the triangle. The carpenters did not distribute their struts evenly. Instead, they grouped them, created vigorous fan-shaped forms and larger rhomboid-like forms within those in the lattice. However, working within these three ways to articulate, no building team created the same; on the contrary, each roof is quite different. The local building teams did not copy each other, even if some churches are located very close, for example Gökhem and Marka. Thus, they created both unity and diversity within the cluster of five roofs, as well as within each individual roof. With this, I argue that the five roofs were clearly not mere roof-carriers. The building teams seem to agree with Gombrich that ‘variatio delectat’. If a ‘rule’ in their architecture-game was to emphasize rhomboids in a vigorous lattice-grid, this instruction allowed for a lot of ‘leeway’, diversity.

Looking in Gullbrandsson’s catalogue over roofs in Västergötland (Gullbrandsson 2015), there are a number of variations, and some may well fit these same characteristics, if explored further. Could they be compared to other roofs from this period in other parts of Scandinavia? The examples are few. Looking east, the roof in Forshem has a surviving mate in the contemporary roof over the nave in Garde church [1140], in Gotland, Sweden. This includes seventeen similar trusses, with rafters curved in a similar way. The rafters and struts in Garde are no longer entirely in their original position, but may well have formed a next to perfect large rhomboid as in Forshem to begin with.

Looking north west, the quite different [with scissor bracing and a collar] late twelfth century trusses, in Haltdalen stave church in Trondheim, Norway, in fact forms a large

rhomboid or diamond out of four smaller, at the top. The builders obviously framed this rhomboid to stand out and catch the eye. This small wooden church has a nave that is similar to the churches in Västergötland.

### **Gradual making**

Gombrich clarifies that organic rhythms are flexible and adaptable as they include a contrast between rational planning, irrational creation and rhythmical movements (Gombrich 2012:11f). He finds that living variety does neither fail [too monotonous], nor upset [too crazy] the desired result (ibid). Gombrich argues that to enhance the interest of a routine by introducing a new element, or “holding on to the rhythm while avoiding monotony”, is a procedure that have a “psychological kinship with ornamentation in the visual arts and in music” (ibid:12). He calls this ‘graded complication’ (ibid).

The making of horizontal plan layouts in the church attics revealed that the tiebeams were spaced slightly different over the five attics. The tiebeams in for example Gökhem were spaced at an average of 0.65 m apart c-c; however, this measure varies within about five cm. The carpenters did not put the struts in place exactly alike in each truss either. Thus, drawing the struts onto the tiebeams in the plan layouts does not form straight lines; instead, they are ‘billowing’ over the tiebeams. In addition, the drawings of trusses in upright views shows how the carpenters placed the intersections between struts/struts and struts/rafters, in slightly different positions, though all within the limits of the ‘fan’ shape. I propose that the five roofs’ characters may be examples of graded complication. My argument is that the structures include variation and rhythmical movements in tandem with rational planning. Even if the variety and rhythm only resulted in subtle articulations, these have a large impact over the roofs’ architecture as a whole. So what was this, to work gradually? In particular, I will focus attention on the roof in Gökhem.

The carpenters started with whole trees, halves or in some cases quarters to make tiebeams, rafters and struts. They split the halves and quarters. The parts are long and relatively straight, though they naturally bend a little. In Gökhem, all the rafters are c 6.9 m long. The two shortest struts are about 4 m and the longest about 6 m. Both rafters and struts are slender; their height vary 13–15 cm, and they are about 10 cm across. The struts and rafters in the other roofs are similar; the parts are long and slender, and the wood is straight grown. The dimensions vary slightly between the five roofs, as well as within each roof. The carpenters kept the natural bend in the timber, and they did not make the parts square. However, they made distinct sharp edges. They prepared all surfaces; nothing is untouched, and they left almost no waney edges. All traces are from cutting tools, axes and drawknife. There are no traces from a saw. Their hewing technique (cf. Storsletten 2016:255)<sup>4</sup>, created characteristic patterns. The surfaces are not flat, but rippled; they resemble flowing water or a flag flapping in the wind. In some cases, a carpenter seem to have gone back and forth along a part, creating ‘bands’ of patterns. The carpenters seem to have worked along the timbers rather than across. Thus, in one stroke, the axe egg both ‘cut in’ and ‘cut out’ in the same direction, and

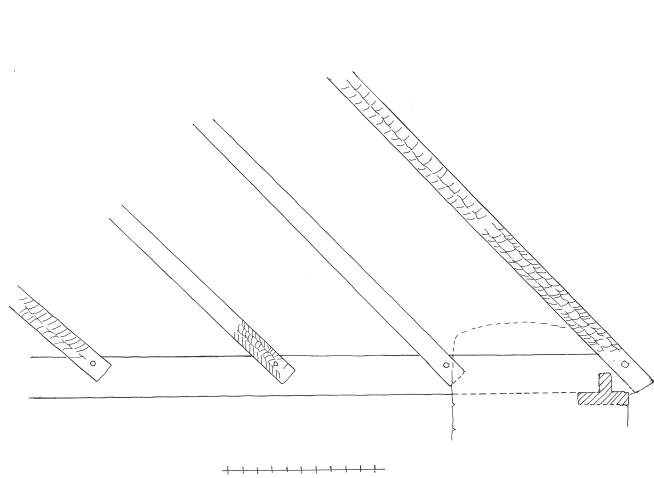
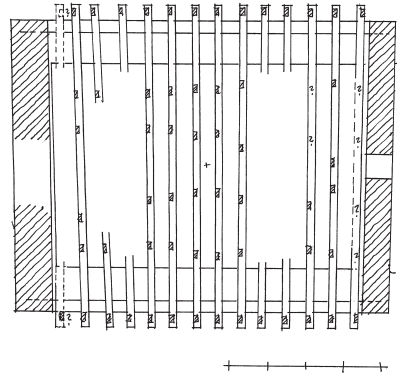
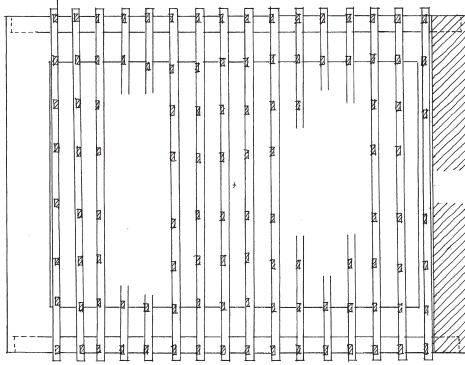
no part of the wood was torn or peeled off; importantly, every fibre was cut. Because of this, the uneven surfaces are almost as if planed. They are smooth and soft to the touch. Experiments show that it is possible to make similar surfaces in this technique with different kinds of axes, and of course, practice (Nilsson 2003). The traces from strokes and movements in the five attics suggest that the carpenters were skilled and had routine. There was room for small mistakes; these did not upset the overall result. The carpenters prepared some surfaces twice. These, which had first been hewn, they subsequently planed flat. In Gökhem and Forshem, for example they made the bottom side of the tiebeams, which faced the room below, not just straight, but also perfectly flat and smooth. It is sometimes hard to judge if the traces from the second preparation was carried out much later e.g. in connection with that the roof was moved in Forsby, Eriksberg and Marka.

The carpenter Willebrand (2012:23f) finds that the middle of some of the tiebeams in Gökhem is marked, delimited with two scribed lines, set 4.5–8.5 cm apart (ibid). Willebrand suggests these lines helped find the middle, in order to put the rafters in place and consequently determine the height of the ridge. The rafters in Gökhem are straight and the sixteen rafter-couples support the roofing relatively evenly. The rafter-couples in the other roofs also seem to be similarly straight and even.

The struts, by contrast, were not placed as evenly in Gökhem, or in any of the five roofs. They all vary a little. On the other hand, none of the struts was placed completely out of order either. To perform this ‘free articulation within limits’, the carpenters likely used some systematic procedure. Willebrand points out that an efficient way to make a number of trusses exactly the same, would be to make a prototype, a master template, which you copy. However, he proposes that the carpenters in Gökhem probably used another method (Willebrand 2012:30). Willebrand experiments building a reconstruction of a truss in the scale 1:2. He finds that if he uses a reference line, from the ridge to the middle of the tiebeam, at which all struts in the grid ‘must’ cross, in combination with his ‘eye’, he can accomplish a comparable form and articulation (ibid). Willebrand underlines that there might be other additional references, measures, points or lines, which the carpenters worked with, yet he argues that the procedure, to use a reference in combination with the naked eye, seem to suffice for obtaining a similar result (ibid:41).

In all but a few trusses in Gökhem, the carpenters placed and joined the three struts that goes from the bottom at the tiebeam to the southern rafter first, followed by the three others

**Fig. 3.8.** Above left, plan over the attic in Gökhem. Above right, plan over the attic in Marka. The ‘cut’ is just over the tiebeams, which shows how the struts land on the tiebeam, as they are ‘billowing’ over the roof. Below left, the joinery in Gamla Eriksberg is different from the other four roofs as the carpenters solved the joining of rafter/strut by just putting the struts into small grooves in the rafters’ bottom sides. Below right, example joinery in Gökhem. The carpenters scribed the discs’ radius into the wood; it forms a perfect circle even though the discs edges are uneven. Photo 2015. Underneath left, joinery in Gökhem and underneath right, surfaces in three different struts belonging to the same truss [3] in Gökhem. Based on a recording by Stornes 2011.



on top. In Marka, they followed the same procedure, using only four struts in total. The carpenters in Forsby placed their six struts differently. They first put the longest truss towards north in place, then the longest towards south across, on top. Thereafter the two middle sized struts, and last the two shortest. Like braiding with stiff thread. However, there are a number of variations on this theme in the fourteen trusses in Forsby. In Gamla Eriksberg, they placed their four struts one at a time, as in Forsby. However, the two shortest struts do in fact not cross each other. They just meet at the middle of the tiebeam.

The carpenters joined the different parts in each truss, mainly, with straight, halved lap joints. They fastened the rafters and struts to the tiebeams in notches, which they made in one side of the thick beams. This way they created front- and backsides in the trusses. They were generally more careful to make the intersections tight and flat in the front sides and at the tiebeam. If they made mistakes, they fixed them, in the front sides carefully (Willebrand 2012:33). In most cases, they made straight lap joints at the intersections strut/rafter and strut/strut. In Gökhem, they made the grooves for struts across the whole width of the rafter, in all trusses. In Forsby, they made the intersections in varying ways. The differences occur even within the same individual truss. In Eriksberg, the carpenters solved the joining of rafter/strut in a completely different way, as they just put the struts into small recesses in the rafters' bottom sides. However, they made the intersection between struts and tiebeams as in Gökhem and Forsby.

Summing up. The carpenters made the truss' triangle, i.e. tiebeam and rafters, even and precise. They probably established a reference perhaps for example the middle plumb line, or perhaps one or two points, marked with a radius. Then they subsequently placed the struts, at an eye measured 'straight within limits'. They placed the struts in gradually. In Forsby and Eriksberg, they braided them together one at a time. In Gökhem and Marka, they grouped them, the struts in one side and then the other. However, within the same roof there also occur some variation in how they ordered the placement of struts in a truss. They locked the intersections in simple, and again, varying ways of joinery, and with two different materials, wood dowels and iron nails. In particular, the iron nails seem to have two tasks, as they are both decorative and hold the parts together. They secured the nails by bending them on the backside, which resembles textile, woven techniques. They could have placed decorative nails next to joints with wooden dowels. This may seem easier. However, they did not. The result, i.e. the trusses' forms, were iterated, but not copied precisely. There were rules but these offered, perhaps even required, free making within limits. The carpenters introduced new components gradually in the process, and each step was building on the result of the previous, at least partly. They did not make the inner bracing of their trusses right angled, straight, flat or precise, just, almost.

### **Perfectly billowing**

The idea of gradual making is interesting today in part because it is unusual in new and often complex building projects. This part seeks to cast light on what the building teams

made 850 years ago by comparing to examples of relatively new works of architecture. The architectural historian Adrian Forty finds that “goods are sold to us as perfect” today, and that the idea of perfection has transferred to architecture in the last fifty years (Forty 2014:21f). He continues pointing out that this merges with another, already long existing notion of perfection within Western architecture, the idea that it is one of the purposes of art to “create order out of the inherent disorder of the world” (ibid). Forty finds an example in the clipped baroque hedges at Versailles, where straight lines contrast the chaos of the natural surroundings (ibid). However, there are also examples of challenges to the idea of perfection in architecture. One is of course the nineteenth century writer John Ruskin, who found the incompleteness in medieval buildings important. Forty finds that,

Looking at medieval buildings, Ruskin was struck by their frequent imperfections, and in these imperfections Ruskin saw the signs of intense impatience, of a struggle to attain something that it was beyond the masons means to attain. /.../ Ruskin was impressed by the way medieval craftsmen could show contempt for exact symmetry and measurement, and could be careless with the details, because they were so determined to pull off the whole thing (Forty 2014:22).

Hence, to Ruskin, the imperfection was an expression that revealed energy and purpose in the process of building. Could it be that the carpenters who constructed the five roofs were in fact incompetent and careless? Were they so eager to finish the roofs quickly that they placed the struts a little here and there, in a hurry? My understanding is that the consistent fan-shapes, the billowing within limits and the simple but well-made joinery cannot be accidental, on the contrary. They made mistakes, but not many and they fixed them. I propose that their making was instead ‘perfectly billowing’, i.e. a generally accepted idea of what was right, the rules in the game. However, their idea of perfect is different from the [precise, straight and square] perception of what is perfect, today.

According to Forty, another example of challenge to the notion perfect in architecture was a component in early modernism (Forty 2014:23). Forty points out that the architect Le Corbusier [who read and learned from Ruskin], designed buildings in the 1950s, for example the Unité and La Tourette, in which the finishes were notoriously uneven (ibid). Forty argues that the roughness “was subsequently interpreted as an artistic gesture”, and suggests that Le Corbusier accepted the roughness due in part to his knowledge of Ruskin (ibid). Yet, Forty finds that buildings that are conceived imperfect, “goes against the grain of the whole Western tradition of architecture” (ibid:23), and gives the example, the InterAction Centre in London, designed by Cedric Price [built 1976 and demolished in 2003]. Another architect who has worked at length with the notion imperfect is Frank Gehry. Forty points at Gehry’s own house from the 1970s, in Santa Monica, California.

Taking Forty’s line of thoughts, and focusing on the architectural characters in the roofs, i.e. rational planning, accidental creation and rhythmical movements, Gehry has created a building, which is a good example of his way of playing with the notion imperfect, or perhaps rather flowing and billowing. It is the Chau Cahak Wing building, at the University of Technology in Sydney, which opened in 2015. This building’s architectural structure is extremely complicated, curvy and wildly flowing. It was described as a “beautiful trashed paper

bag” at the opening ceremony (Frearson 2015). According to Gehry, it was a tree house at a countryside farm, which inspired his design (e.g. Arkitekten 2015, 2:25). Interviewed in February 2015, Gehry describes his own design work with this building, as “a growing learning organism with many branches of thought, some robust and some ephemeral and delicate” (Frearson 2015). The curvy façade was calculated in 3D, and it required custom-designed bricks to build. It took the bricklayers two years to raise the wall, which was performed by hand (Arkitekten 2015 2:25). However, in this the setting of bricks there was minimal margin and no leeway. The masons testify that it was extremely complicated work (ibid).

In this work, the architect Gehry designed and planned for an organic appearance ahead of the actual building activity. It is not the activity, building with bricks by hand, that created this articulation. The skilled handwork instead followed, perfectly and in detail, the designed flowing. Thus, Gehry’s pursuit of a flowing articulation is far from gradual and organic. It was creative at first, but the actual making was not. In fact this probably cannot be, in a large-scale high tech modern building. Everything has to be coordinated with infrastructure and substructures of various kind, and with many other consultants. Minute control is necessary. It is perhaps possible to compare the wildly flowing Chau Cahak Wing building with the seemingly opposite French baroque hedges, which Forty referred to. The straight hedge-lines do not only create a distinction to the flowing landscape around them, they also contrast and strongly control the growing hedges themselves. The wild organic stuff, which make up the straight lines<sup>5</sup>. The wild lines in Sydney strongly communicate control, even if they were frozen in an extremely complicated flow. Ruskin emphasized the soulless perfection of the machine, however, Gombrich finds that this “blinded him to the kinship between rational and organic creating” (Gombrich 2012:11f). Gombrich points out that something straight, made with “ruler and compass” could be part of [a pleasing] pattern making, as much as “curving lines” (ibid). If it is not in fact about the curves, is it perhaps about rational, gradual making?

The work in the five roofs is in my view handicraft. The anthropologist Tim Ingolds analyses such craft in the example basket weaving (2013:22ff). He finds that the willow, which seems to fit so naturally in a finished basket, was in fact not easy to bend into that shape. It requires force and skill to control the form of a basket. Ingolds points out that a basket takes form in the “force field” between the weaver and the willow, and that the dimensions of a basket relates directly to arm-reach and shoulder-height (ibid). The carpenters in the five churches worked in a similar way with their split wood. They used their hands, strength and a few simple tools. They made a structure that was an easy assembly, but which takes force and skill to shape. It was possible to improvise if they made mistakes. I argue that putting the trusses together was, with Gombrich, a ‘graded complication’, and with Ingolds, that their methods resemble craft.

Perhaps such gradually constructed elements of architecture belong to the past, and are not possible to find in new Western architecture? Yet, some architects who are also artists practice a gradual or organic approach to architecture. The works of architect and artist Maya Ying Lin contrasts Gehry’s approach. Lin is concerned about humanity’s place in



the natural rather than in man-made environment (Filler 2016:53). Her 'earth' works for example are site specific and have topographic awareness, and they include gradual making and leeway in large-scale processes. In the project 'Eleven minute line', 2004 [The Wanås foundation, Knislinge, Sweden], the first sketch was made at the site in the gravel, and this was subsequently translated into topographic models (Lin 2015:62). Lin made "countless adjustments to the drawing /.../ once we had staked the entire site, changing it to fit into the scale and slope of the pasture" (ibid). The 'Storm King wavefield' 2009, [Storm King art center, Mountainville, New York], was created at an environmental reclamation site, where Lin used the existing earth and introduced native grasses (ibid:52). Lin worked at the sites in tandem with bulldozers (ibid:61, 69).

The architect and artist Patricia Johanson has a different approach. She creates large environmental projects, parks, e.g. the 'Petaluma Wetlands Park and Water Recycling Facility' 2001–2005 [Petaluma, California] (Kelly & Johanson 2006:94–100), rather than objects (ibid:47). She incorporates nature in her large-scale art works, and they change over time. Johanson says, "[m]any of the ideas are fairly simple, /.../ I try to design so that the flow of nature is made manifest" (ibid:51). She explains, "There is an idea of art as a series of perfect, ideal objects" (ibid), however, "the important thing is not my sculpture, but what happens to it" (ibid:53). Johanson does not aim for perfect control, by contrast, to her, "unplanned experiences makes the work richer" (ibid). Johanson's land sculptures, often in the form of straight or curvy 'lines' which people can walk on or along, provides frameworks for the environment around. As part of her design process, Johanson researches the local environments thoroughly, and her tool is not an axe or a bulldozer, she creates a [reference] line, and [plans for] plants and animals to finish the job around it, gradually. In fact her projects are never really finished.

Moving around in the attics, the roofs actually feel organic, like being in a tight 'forest'. The forest is vigorous, rhythmically billowing and see through. However, not raw, as in a living one. The carpenters prepared every inch of surface in a flowing, gradual way, and completed all joints carefully. Thus, the carpenters working 850 years ago articulated something, which is unusual today. They made mistakes, but only few. They made the internal truss bracing rationally and carefully. However, there was room for both rules and leeway in the very act of making. In my view, the roofs are thus like the site-specific, three-dimensional and hand-made installations. The roofs, as element of architecture, are lively and vivid, and their articulation was a sharp contrast to the firm box, the solid heavy walls below.

### **Traces of paint**

Surprisingly, the investigations show that traces of a very thin layer of white paint occur in some places, probably, but not for certain, in all of the five roofs. This, that the timbers may have been painted white, took a while to realize. The remains are very thin; to begin with, I thought it was perhaps growth, lichens. However, a tentative analysis, based on samples from Gökhem performed by conservator Margareta Ekroth-Edebo, suggest that the paint

was made of lime. Under one tiebeam in Gökhem, we also found a black line painted, which was contrasting the white surface. In fact, there are a few other traces of paint, also in other roofs. Gullbrandsson has observed white paint in other roofs in Västergötland (Gullbrandsson 2015), and Ericsson (2014) found white paint on trusses in Knista (ibid:55) and Mosjö (ibid:77) churches, in the region north of Västergötland, Närke. In Mosjö, he also found black paint, as well as red paint on one iron nail [Fig.3.9.] (ibid). If the nails were painted red, the forms, which were shaped by nails, would stand out in a sharp contrast to the white grid of struts.

However, even though the question about paint is of importance to the analyses of the interior architecture, the search for possible original remains of paint in the roofs has had to be excluded in the thesis. This is a task, which require the expertise of a conservator. The reasons to paint may be various apart from the aesthetical, lime may have been considered protect against pests, and the red, if lead, protect from corrosion. However, the tentative analysis suggest that we should picture the roofs as clad in brilliant white, perhaps with red paint to enhance the pattern effect.

### 3.4. ASSEMBLED ARTICULATIONS

The vivid roofs in wood contrasted the firm rectangular box in stone below. The carpenters worked on the one hand with practiced skill, which was routine for them, however, on the other, they deliberately made some things and arrangements to create effects. I argue that these were connected to, and influenced the box below in various ways. The search in this sub-chapter is about how, and I propose draw from a comparison with mid-twelfth century music.

The twelfth century Benedictine abbess Hildegard of Bingen [1098–1179] was a writer and composer in the Rhineland, in south Germany. She composed a kind of monophonic plainsong i.e. a line sung in unison or octaves. Hildegard varied short phrases and motifs, and the singers lingers on one syllable as it ascends and descends (Atherton 2001:xxxviif). Hildegard composed with intent, she wrote to St Bernard of Clairevaux, explaining that this way her text and music embodies the idea of “the sacred sound through which all creation resounds” (ibid). Music critic Fiona Maddocks finds that, though a matter of debate, Hildegard’s music was almost certainly sung in unmeasured time (Maddocks 2003:192). Maddocks suggests that the rhythmic shape may instead have “grown out of the groupings of words rather than from an externally imposed pattern” (ibid:192). Also the tuning was approximate, “the idea of a fixed pitch /.../ a note called C which always sounds the same, was not yet known” (ibid:192). Thus, Maddocks underlines that Hildegard’s music is hard to remember and not easy to sing, and comes close to improvisation (ibid:198). Each new performance is slightly different. These characteristics, for example that it was unmeasured or approximate, which requires skill to perform, and is close to improvisation, could well describe the gradual making and ‘variety-within-unity’ that the carpenters performed in the roofs.



**Fig. 3.9.** In Mosjö church in Närke, red paint remains on an iron nail. Remains of white paint occur in many places in this roof, and in some cases traces of black (Eriksson & Borg 2014:76f, 81). The roof over the nave in Mosjö church has been dated with dendrochronology to 1214 (ibid). Photo Eriksson 2014.

Hildegard's song texts communicated images like greenness, growth and fecundity (Maddocks 2003:194), and these sensual notions are of course not possible to compare to the carpentry. However, the carpenters in one church, Gökhem, formed some trusses artistically and perhaps symbolically. They included shapes such as circular discs, quatrefoil and cruciform (cf. Courteney & Alcock 2015:162; Karlsson 1976:24), which makes their wooden construction stand out. Because of this, the roof in Gökhem provides possibilities for analyses. Forms like quatrefoil and cruciform obviously fit well into the early medieval church setting. However, how these forms may have been symbolic art, what sensual or religious images these forms perhaps communicated in the mid-twelfth century and at different times later, is not the issue here. Instead, Maddocks's idea that the music's rhythm may have grown out of 'groupings of words' inspire my examination. I translate this to 'assembled articulations', and search for such gatherings in the roof in Gökhem. The questions are about 1) how the building team shaped, oriented and put together the various created forms and other articulations in the roof, and 2) where they placed these gatherings over the nave. The investigation starts with an overview of the trusses and the whole roof. Thereafter it moves over the attic, from west towards east. The focus is on Gökhem however, the roofs in Forsby, Forshem and Marka are brought in. The roof in Eriksberg is excluded because it is so uncertain.

### **A variety of shapes, orientation and placement**

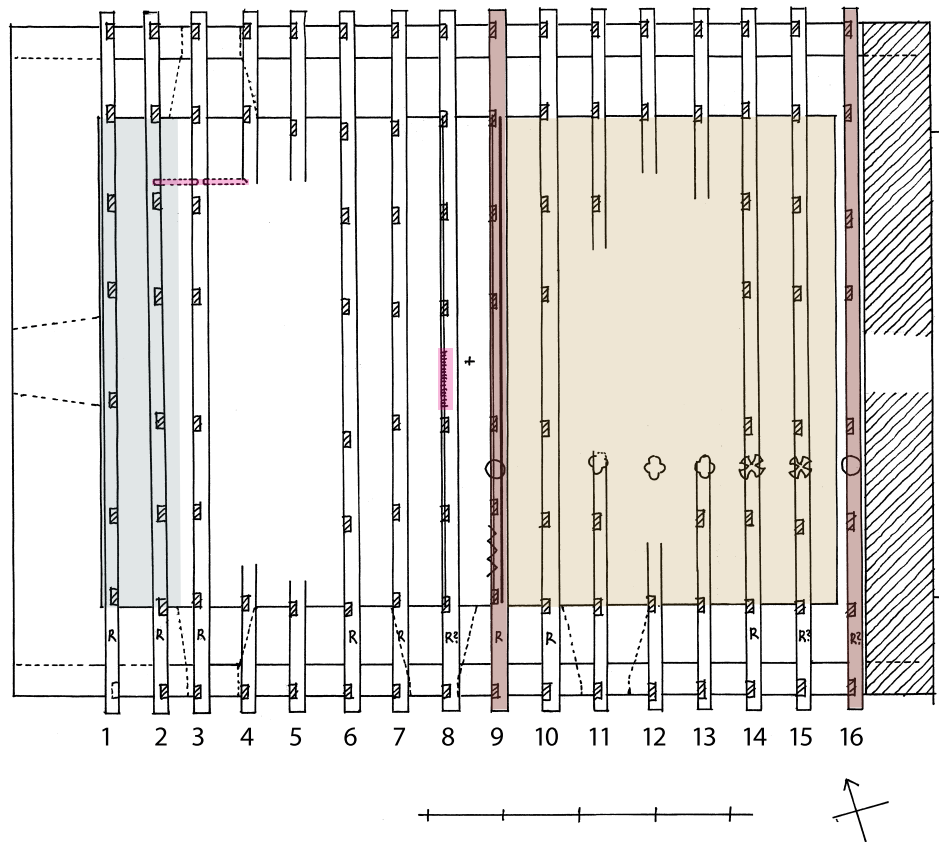
The carpenters in Gökhem used six crossed struts in all sixteen trusses. All trusses in the roof have the same fan-shaped assembly; the carpenters grouped the struts towards the middle of the truss triangle. All trusses thereby include a grid with nine rhomboids. In addition, the carpenters gave each truss a front and a backside. They achieved this by fastening the rafters and struts to the same side of the [much thicker] tiebeam. They prepared the front surfaces particularly well, these are smooth and flat, and made sure the joinery was particularly tight on this side.

The carpenters in Gökhem made only one truss, the most western [1] with merely straight parts. This individual truss is thereby similar to the lattice in Forsby and Marka. Nine trusses [2–8 and 10] have instead the unique and characteristic ‘Gökhem’ look. In this, the carpenters emphasized the struts’ intersections. They shaped the struts slightly curved, so they meet softly and not in straight angles. However, they made only the front part of each strut like this. The backsides are straight. This emphasises what is front and back in each intersection of struts. The rounded, and thin, front part, makes the appearance [seen from an angle] thin and elegant, even sophisticated. Seven trusses include various other shapes, two trusses have circular discs [9 and 16], three include the ‘quatrefoil’ [11, 12 and 13], and two have cruciform [14 and 15].

The carpenters in Gökhem seem to have made sure to place the root end of the tiebeams towards south perhaps in each of the 16 trusses. This is not a safe interpretation, and it is not easy to examine. The tiebeams were carefully prepared, and made next to straight, and thus, they are not always visibly or measurably thicker at the root end. The timbers are about 9 m long and the difference between the two ends [measured at the inside of the walls, which is 6.5 m apart] is not significant. Root-top can instead be determined by inspecting the cut off branches, the knots. Branches mostly grow upwards, and examining where the centre is in the knots, suggests how the tree grew. Carpenter Bygdén investigated knots and suggested root and top ends in Gökhem in 2011<sup>6</sup>. In many, however not all cases, he suggested which are the root ends by examining the knots. However, it was for example not possible to determine in the tiebeams that had been cut off for the vaults. How the carpenters knew or remembered what was root-top during the building project in 1141 we cannot know of course, but it probably required an effort. Thus, I argue that the builders may have placed the root ends over the south wall with intent. Similarly, in Forsby, likely all trusses, except probably truss number 2 and 8, have the tiebeam root end towards south. In the other roofs, there was too much uncertainty to say. A more robust interpretation would require further examinations.

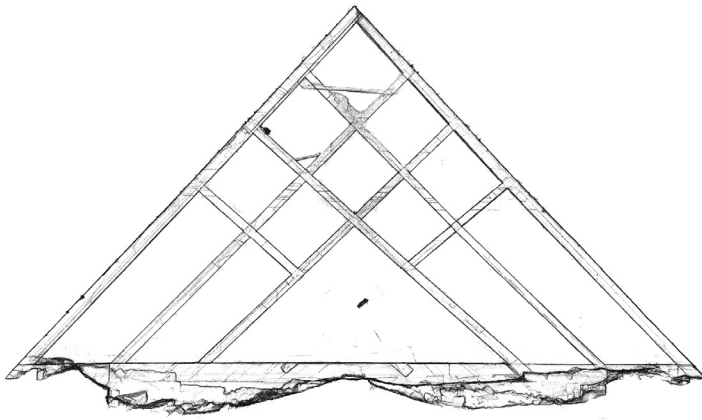
### **In the West**

Today there is not a masonry gable top towards west over the old nave in Gökhem. As discussed in chapter 2, it is not certain that one was ever raised in stone and mortar. An alternative is that they covered the gable top with wooden boards. If so, there was perhaps two



**Fig. 3.10.** Plan of the roof in Gökhem. The builders in Gökhem placed the two trusses that face east, number 1 and 2, over the most western part of the nave, by the west wall. The other fourteen trusses, which face west, were spaced over the rest of the room. Trusses, which include circular discs, are number 9 and 16, quatrefoils are number [11?], 12 and 13, crosses occur in number 14 and 15. The traces in the north-west corner suggest that something happened below, which is in the northwest corner of the nave next to the entrance in the north wall. Perhaps bells were hanging here.

more trusses to begin with [west of the presently most western truss], to cover over the top of the thick wall. A comparison between the placement of the roofs' two outermost trusses [1 and 16] supports this interpretation, as the two trusses were placed differently in relation to each gable side. The masons made the east masonry gable thinner than the wall below and thus created a narrow shelf on top of the inner side [towards the room]. They then placed the most eastern truss [16] on this shelf, right next to the masonry gable top. The [presently] most western truss [1] on the other hand, was placed further in, on the inside of the thick wall below. This means that there was a different assembly on the west side than on the east side of the room, and this suggests that the west had a different kind of gable top. The most western truss with just straight parts [1] is ambiguous. It may on the one hand be that the



**Fig. 3.11.** **Left** 3D laser scan of the west truss [1]. Spetz 2014. **Right** trace from something hanging in the tiebeams [2, 3 and 4]. Photo Eriksson 2012.

builders thought it less important, since they made it with straight struts instead of with fancy curves. One suggestion is that the carpenters made this truss simple as it was next to a gable and thereby not in plain view. This could be compared to for example Forsby church, where the two trusses next to each gable have fewer struts compared to the others in the roof. On the other hand, it may indeed be the opposite; it is possible it was important because they formed it differently.

The builders in Gökhem oriented the two most western trusses [1 and 2] with their front sides facing the room, i.e. towards east. The next truss [3] was turned around, its' front side facing west, as does all the remaining trusses. Thus, trusses facing east meets trusses facing west, face-to-face. Measured from the inside of the west wall, the shift occurs about a meter into the room. The zone between west and east, face to face, is narrow, about 35 cm wide. The possibly original entrances, in the south and north walls, are located underneath just inside this. I argue that the shift in the roof above may mark the nave's entrance zone. Because of this, there was an 'east part of the room', which started here under the shift. The same or similar patterns occur in Forsby, and perhaps in Marka. In all, the carpenters assembled the trusses, and oriented and placed their front sides systematically. In doing this, awareness of the four winds was of importance and this was likely a 'rule' in the church building game.

Next to the north wall, over the possibly north entrance in Gökhem, four rounded notches were cut out in three tiebeams [2, 3 and 4]. The traces likely mark a specific activity that took place underneath. The smooth surfaces suggest that something was hanging here, rocking back and forth. This could be for example bells ringing, or perhaps, the top lid of a font, which was hoisted up and down. The notches are set for two things hanging, one on each side of the west-meets-east zone.

### In the middle

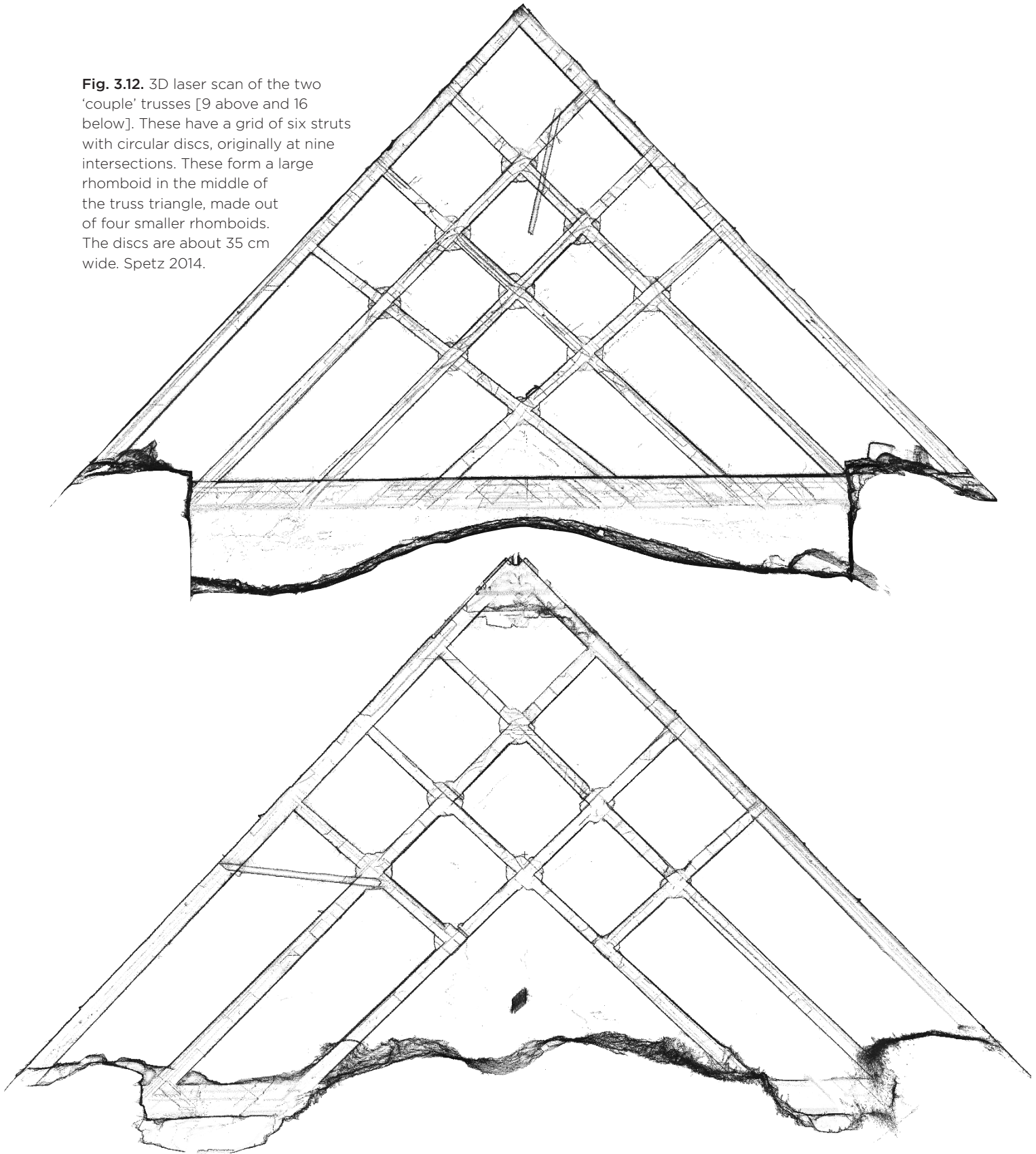
Two trusses [8 and 9] mark the middle of the nave. This is less than 5 m from the west wall, and only a few steps from the original south entrance. The two trusses were placed on each side of the middle. This position is above one of the two original windows, placed just west of the middle line, high up on the south wall [now closed by the vaults].

The truss [8] just west of the middle, has the basic Gökhem truss shape. However, the carpenter underlined its' front side, with a thin curve on the tiebeams' [west] bottom edge. At the middle of this same tiebeam, on the top, there is a distinct area damaged by rot. The depression is narrow but long, about 60-70 cm, and it is quite deep. One could imagine something hanging from this place, marking the middle. However, there is no obvious trace from an attachment. In addition, the rot suggest water. Maybe the outer roof above has been leaking. This could have been, however the spot is almost too local for this explanation. If there was a hole in the outer roof, it must have been small and located precisely above the front of this truss. Perhaps there was in fact an opening, but one that was made with intent, and not the result of bad maintenance, like a wind-eye? The roof in Forsby, as discussed in chapter 3.3, could point to this possibility. If there were an opening in the roof in Forsby, the tunnel would have cast the light down to the middle of the room.

The carpenters formed the next truss [9], on the east side of the middle, quite differently. The grid of six struts has circular discs, originally probably at nine intersections. These form a large rhomboid in the middle of the truss triangle, made out of four smaller rhomboids. The discs are about 35 cm wide. This truss is similar to the most eastern truss [16], and I will come back to these two, looking at them as a couple. However, this truss [9] does not just have discs. The carpenter made a thin curve on the beam's [west] bottom edge, just as in the previous [8], and moreover, its bottom side, which was exposed to the room below, is marked with a long black line. This was painted in the middle of the surface, along the whole underside. There are thin traces of white paint on the surface area around. The black straight line would have been in sharp contrast to the white behind. In addition, this truss [9] is the only one were the carpenters chose to use timber which had been scarred, most likely by lightning. It is the upper south strut, which has this wound. Notably, the carpenters chose not to hide the scar by turning it to the backside; on the contrary, it was exposed at the [west] front side. Further, it was placed in the very middle of the room, and it was well-lit by the window and thus exposed. I interpret that this placement of scarred wood, probably, hit by lightning was intentional.

The middle certainly seem to have been important. Here the roof coincided with openings in the south wall and perhaps even a wind-eye, which let light and possibly even weather in. There were subtle finely carved curved lines in two tiebeams, and a sharp black painted line contrasting the white surface in one. Strong forces like lightning were present in the form of exposed scarred wood. Perhaps it was important that the wound had healed, as the tree had survived. The stretch outlined by the truss [9], marks the middle of the room. The roof offers a staged presence of modifying elements, beams of light, sky, air and wind, perhaps even water in the form of rain, as well as the idea of forceful light and fire, from lightning.

**Fig. 3.12.** 3D laser scan of the two 'couple' trusses [9 above and 16 below]. These have a grid of six struts with circular discs, originally at nine intersections. These form a large rhomboid in the middle of the truss triangle, made out of four smaller rhomboids. The discs are about 35 cm wide. Spetz 2014.







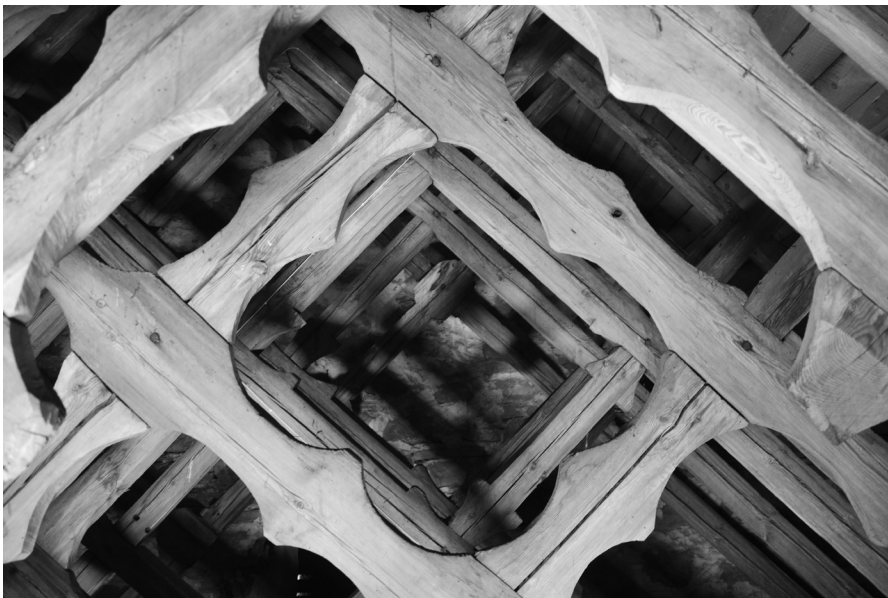
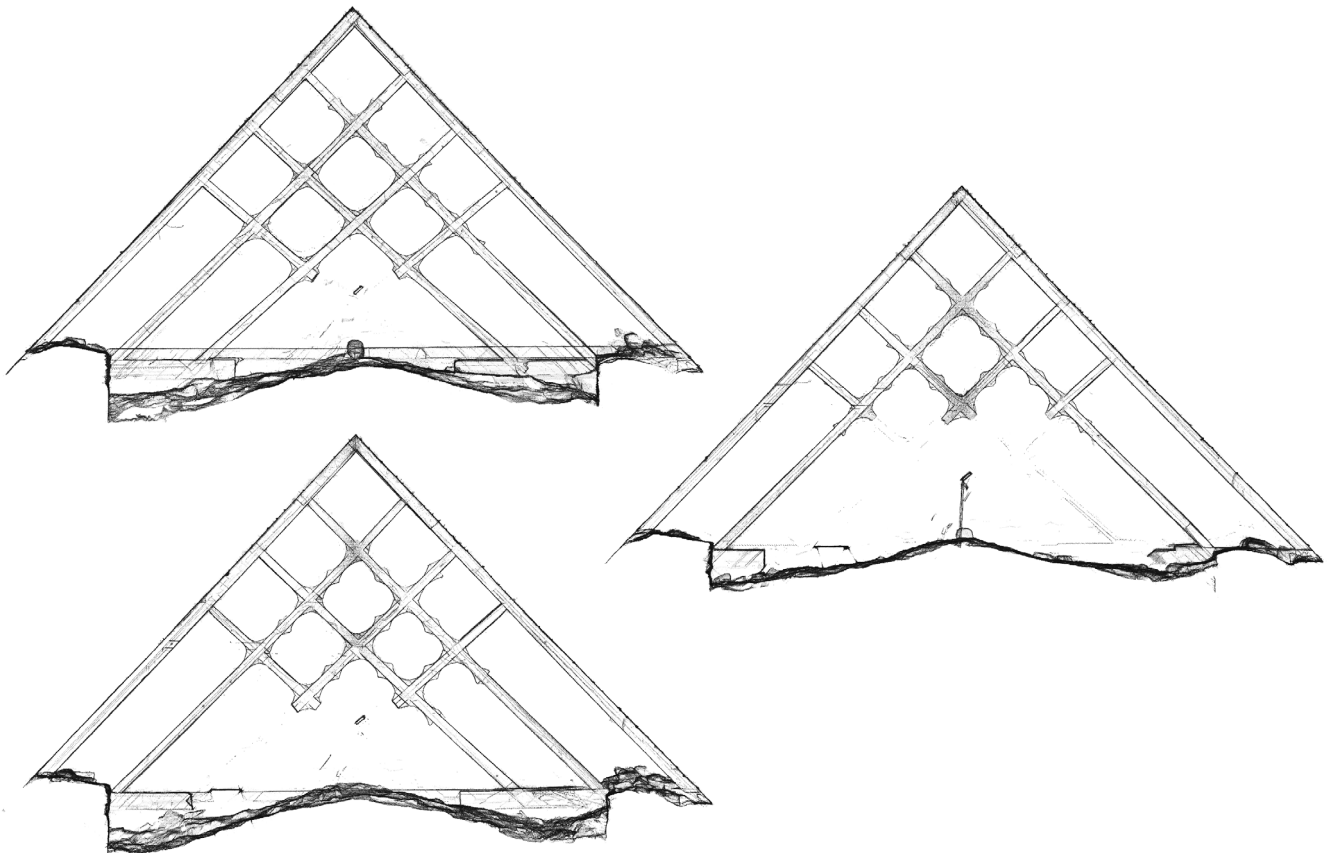
**Fig. 3.13.** **Above**, 3D scan of the scarred strut, placed towards the south wall and the window. This is the only truss were the carpenters chose to use timber which had been scarred like this, likely by lightning. They chose to expose the scar by placing it at the [west] front side. Further, it was placed in the very middle of the room, and it was well lit by the window. I interpret that this placement was intentional. Spetz 2014. **Below left**, the carved thin beaded curve. Photo Eriksson 2012. **Below right**, the black line under the tiebeam [truss 9], which marks the middle of the room. Photo Eriksson 2012.

## In the East

Now I cross the black line that mark the middle of the room and venture into the other half. This part of the roof consists of six trusses [10–15]. They are situated in between those two with circular discs [9 and 16]. The six trusses were put up over the second of the two windows in the south wall, so they were well lit. Four of the trusses [12–15] have drawn attention because the carpenters included decorative forms, quatrefoil and cruciform, which are well known within the field of art history. Karlsson finds that, “the joints [in Gökhem are] formed like Greek crosses, while the series of concave sections /.../ together are experienced as a sequence of quatrefoil”<sup>7</sup> (Karlsson 1976:24). Courteney and Alcock note that it was the struts themselves that were carved to give quatrefoil and cruciform patterns (Courteney and Alcock 2015:162). This is important because it dates the creative activity to the year 1140 or 1141. The shapes could not have been carved later.

The circle segments that make up the quatrefoil forms occur in three trusses [11–13]. In one truss [11], it is only the strut towards south, and the very top of the north, which were equipped with circle segments. The other four struts lack these, and they were made straight from the beginning. It is as if the carpenters started to make quatrefoil forms, but that there was a change of mind. The other trusses [12 and 13] include more or less complete quatrefoils. Notably, the quatrefoils in Gökhem take form in the space between the struts. They are negative forms. The holes between the struts create see trough quatrefoils. The quatrefoils likely appeared in the four middle rhomboids in the trusses [12 and 13]. This would compose a larger rhomboid-with-quatrefoil together. However, none of the three trusses has survived fully. Their tiebeams were subsequently cut off to create space for the vault underneath. Thus, the bottom rhomboids with quatrefoil are now missing or cut in half.

The dictionary Merriam-Webster defines the quatrefoil form as “a conventionalized representation of a flower with four petals or of a leaf with four leaflets” and as “a 4-lobed foliation in architecture” (Merriam-Webster). Thus, the shape consists of four partially overlapping circles. The segments may overlap more or less. Karlsson presents a drawing (Karlsson 1976:24, fig. 11), which includes a view of one truss with quatrefoils in Gökhem. This is made as a theoretical reconstruction of the original situation, as the drawn truss has four complete quatrefoil. The segments overlap a lot. However, some things in Gökhem do not fit this perfect picture. The scan of the three trusses shows that the different quatrefoils vary and they are uneven. They seem unfinished; the shapes do not include all lobes, and those parts that were included are not precise nor symmetrical. In addition, the carpenters made a number of extra circle segments in some struts, more than needed to form the four quatrefoils, but not enough to form additional quatrefoils. This is not due to mistakes or later damage, it is how the carpenters completed and finished the trusses. Another issue with quatrefoil in Gökhem is that they were made so early, in 1140–1141. Even if quatrefoil shapes occasionally occur in surviving twelfth century objects and buildings, they are rare. One example is a quatrefoil in the so-called Soest Antependium, from Westphalia or Cologne, dated to c. 1170 (e.g. Toman 2000:414). Instead the use of quatrefoils to decorate church buildings and artefacts in North West Europe peak later, in the thirteenth- and fourteenth centuries.



**Fig. 3.14.** Above, the 3D laser scans show the three trusses [11, 12, 13]. The different quatrefoils vary and they are uneven. The shapes do not include all lobes, and those parts that were included are not precise nor symmetrical. In addition, the carpenters made extra segments in some struts, more than needed to form the four quatrefoils. This is not due to mistakes or later damage, it is how the carpenters completed and finished the trusses in 1140–1141. Spetz 2014. **Left**, the same trusses seen from west. Photo Eriksson 2012.

The fact that the carpenters made extra circle segments, which are not part of the shaping of a quatrefoil, does neither fit the interpretation. Thus, I ask if it is indeed correct to interpret the forms in Gökhem as quatrefoils. Would it be possible to identify some other shape instead?

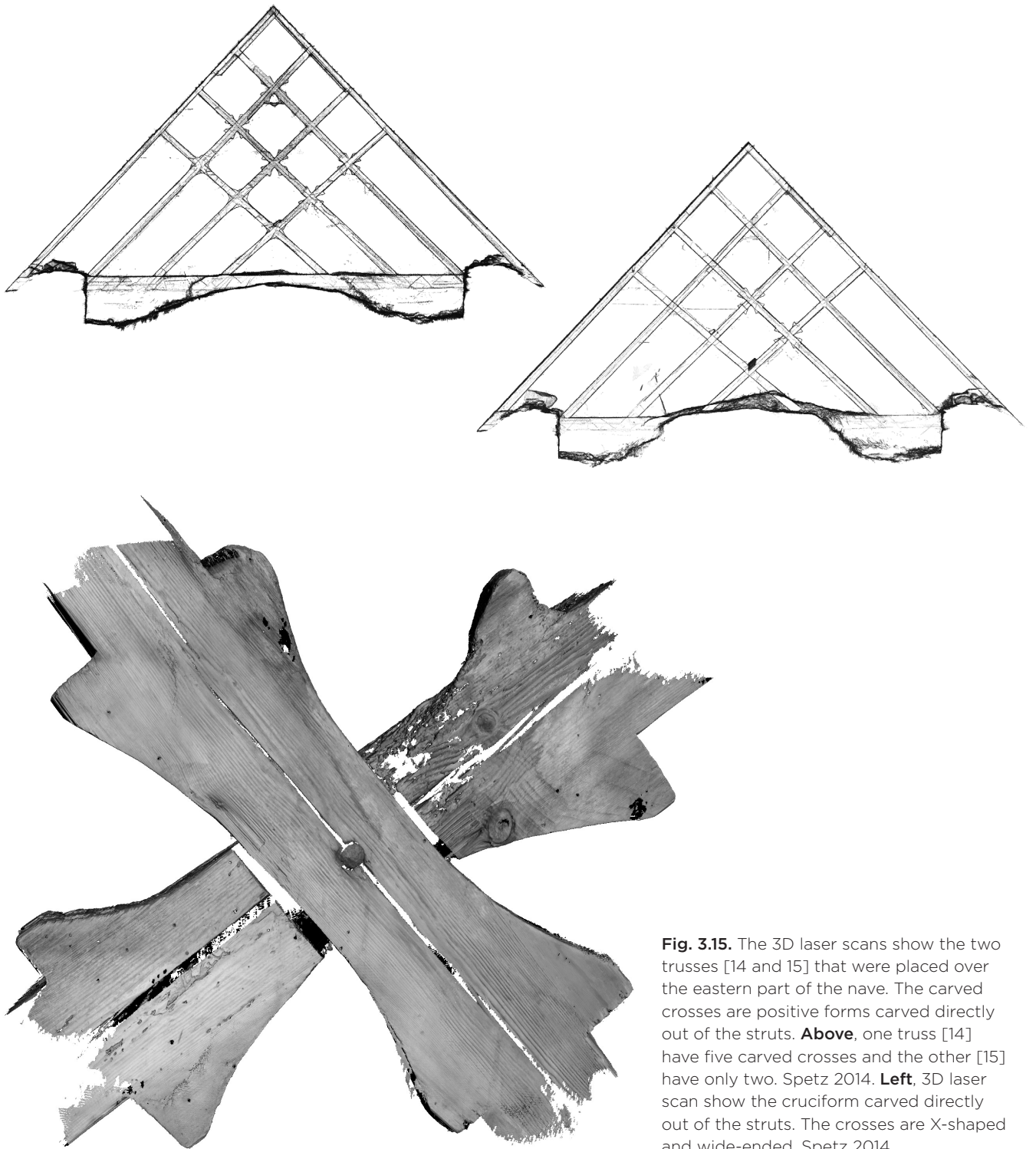
An alternative view is to put focus on the crossing struts as positive shapes instead, and try not to see the spaces in between. Then the crossing struts may resemble an x-shaped cruciform, in which the carpenters made the timbers natural looking, like living tree-trunks. By contrast, this interpretation would maybe fit better with contemporary crosses and images of such. Large X-shaped [St. Andrew's] crosses with arms made of organic looking leafs or curls occur for example in the stave church in Borgund, in Norway. Even earlier pictures of crosses composed of living trunks of trees, like palm trees or the Tree of life, were depicted on pilgrim flasks already from the sixth-seventh century (Cox Miller 2015:103 [fig 5.2 and 5.3]). This interpretation of positive shapes is not impossible. The 'extra' circle segments in Gökhem fits this better. I have argued earlier that the carpenters were skilled and they formed carefully, and notably, they finished their work. If I take this seriously, it points to the 'positive' interpretation. The negative [uneven quatrefoil] shapes that we [want to] see today were perhaps not intended.

The two trusses [14 and 15] were placed over the most eastern part of the nave and they have a carved cruciform at some of the joints. These are indeed positive forms, and they were as the other forms, carved directly out of the struts. One truss [14] have five carved crosses and the other [15] have only two. The struts with carved crosses at the joints were made straight, whereas the struts without carved crosses have the basic soft 'Gökhem type' joinery. The crosses are X-shaped and equally wide-ended. They resemble other contemporary twelfth century or earlier crosses.

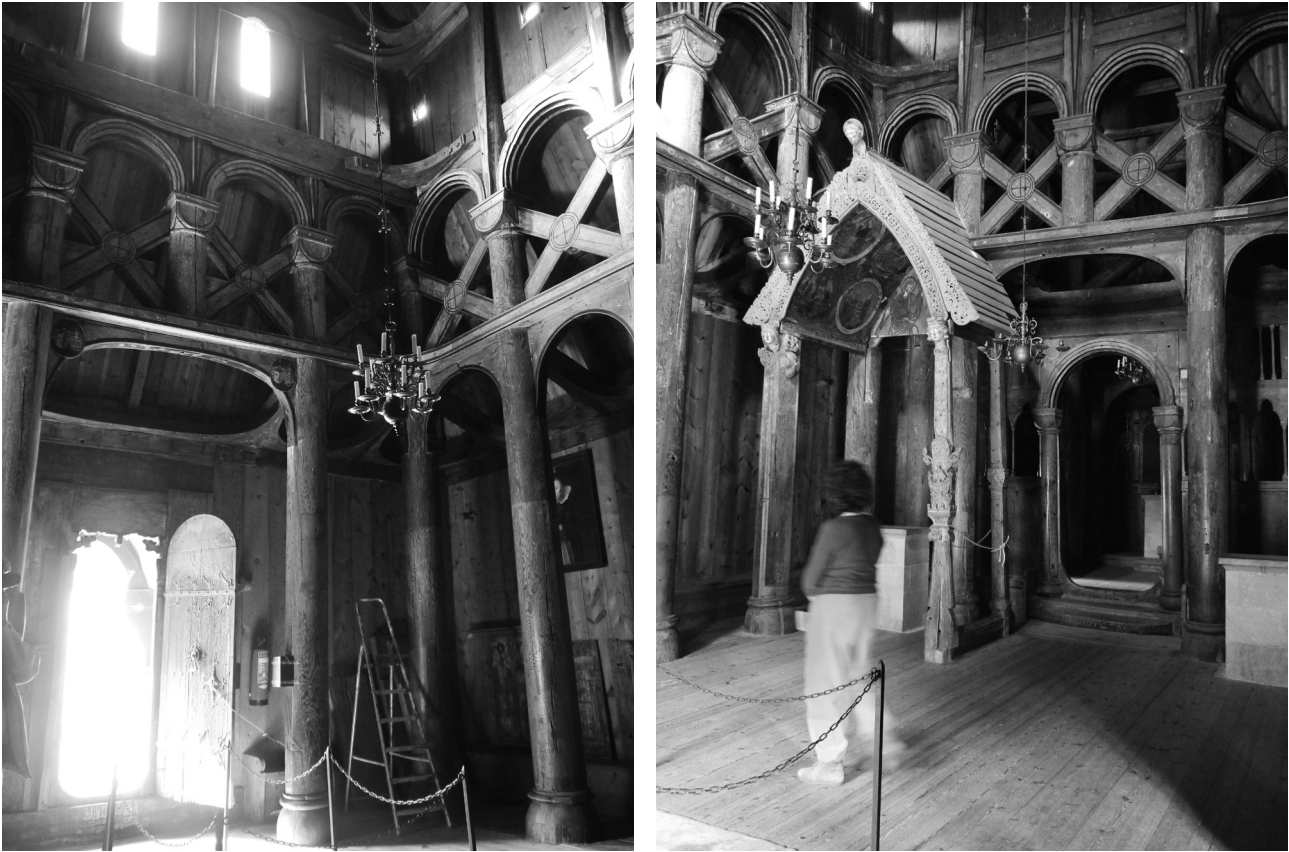
Notably, I have not been able to identify any traces that would suggest a connection between tiebeams [10–15], and the two side altars that would be expected below, in the northeast [Maria?] and southeast [Patron Saint?] corner of the nave. This does not say there are no traces. However, if there are traces, these are not as obvious as those in the northwest corner of the nave. In Marka church, there is a smaller trace in the tiebeams in the southeast corner of the nave, which perhaps could be remains of an arrangement for hanging something. However, the trace is ambiguous.

### **Grids as borders**

The two trusses [9 and 16] were placed in the middle of the nave and towards the eastern gable, i.e. on each side of the six [10-15] that cover the east half of the nave room. The carpenters formed the two alike. The grid of six crossing struts had circular discs at nine intersections. Together the nine discs forms a large rhomboid in the middle of the truss. The carpenters scribed the discs' radius into the wood; it forms a perfect circle even though the discs edges were made uneven. The discs vary somewhat but are about 20–35 cm wide. I interpret these two trusses as a couple, and propose that they mark or enclose a zone, the east half of the nave.



**Fig. 3.15.** The 3D laser scans show the two trusses [14 and 15] that were placed over the eastern part of the nave. The carved crosses are positive forms carved directly out of the struts. **Above**, one truss [14] have five carved crosses and the other [15] have only two. Spetz 2014. **Left**, 3D laser scan show the cruciform carved directly out of the struts. The crosses are X-shaped and wide-ended. Spetz 2014.



**Fig. 3.16.** St. Andreas crosses in Hopperstad stave church form a grid-frame around the elevated middle room space. Photo 2016.

The idea that crossed lines, lattice, which include circular discs, framed the borders of a defined part of the nave in Gökhem was inspired by comparison with stave churches in Norway. The wooden discs in the centre of crossing struts in Gökhem are similar, in both character, construction and size, to the wooden circular discs in the centre of diagonal crossed timbers; the St. Andrew's crosses in a number of stave churches in Norway. Though a matter of debate, Anker finds that these crosses are most likely original (Anker 2010:133, 141f). The discs' surfaces are, as in Gökhem finely prepared, smooth and flat towards the room. The discs have a circle and a cross, carved into the surface, sometimes marked with black paint. In e.g. Hopperstad [1132] (Thun et al 2016:111), the large X-crosses span between posts [stavar] in the nave as well as in the chancel. The crosses encircle the higher middle part of the nave room. The carpenters placed crosses all the way around, five on both sides and four across the gable sides. Viewing the crosses with circular discs in Hopperstad as a whole, they form a broad ribbon composed of crossed lines, around the inner part of the nave room. Anker finds that variations of this [St. Andrew's cross] theme is characteristic to stave churches (Anker 2010:143).

### Notes chapter three

- 1 The roof over the nave dates to 1131 however, since no sapwood is present, 10 years are added, which means the roof was likely constructed sometime after 1141.
- 2 A tradition exist “by virtue of /.../ the consensus they [the practitioners] achieve through a constantly ongoing negotiation” (Tin 2011:246). Tin gives language as an example of one such tradition as it is “governed by rules that we must accept in order to speak and understand what is said” (ibid:225). The language exists but can change and the borders for its domain are not absolute.
- 3 Courteney & Alcock note that the classification by Hoffsummer (2002; 2011) is more complex and intended for all roof types from the earliest period to the nineteenth century, and that Épaud (2007) includes examples classified according to the use of inclined or vertical struts.
- 4 ‘Splash whittling’, in Swedish sprättäljning or splinthuggning. In Norwegian sprettelging.
- 5 I thank Per Cornell for pointing out the idea ‘controlled diversity’, e.g. in works by Borromini, or in Bernini’s Trevi fountain.
- 6 He was assisted by his colleagues Daniel Eriksson and Mattias Hallgren.
- 7 My translation from Swedish, ”skarvarna [i Gökhem är] utformade som grekiska kors, medan serien av konkava snitt i övre skissen tillsammans upplevs som en rad fyrpass”.





## Body and volume: Firm box with lively top

The combination of the previous analyses of walls [chapter 2] and roofs [chapter 3], sketch both [outside] body and [inside] volume. In short, I find that the walls in four naves shaped rectangular ‘firm heavy boxes’. These had similar plan proportions, however, the original heights, and thus volumes, varied. Further, the boxes had openings, doors and windows, which in a few cases are preserved. However, mainly there are only traces, and in some cases only offered as possibilities. Largely, they are doors in the west part of the naves, and a few windows in the middle or east. I interpret that this created a cave-like setting. In addition, the boxes had ‘lively light tops’, the tiebeam roofs. I have found that the five roofs’ articulations differ, yet have similarities; they were variations on a theme. I suggest viewing the large numbers of tiebeams as the top of arches or gates in tandem with that they are trusses. Most ‘gates’ have a front side towards west, and thus, walking under, ‘before’ is on the west side and ‘after’ is on the east. The vivid top largely contrasted the firm box below. However, both box and top related strongly to the four winds. In Gökhem, the combination of entrances and articulations in the roof emphasized the west part, and I argue that this created a well-defined entrance zone. The builders in Gökhem and probably Forsby and Marka also highlighted the middle and east part of the nave. This was created with a psychological barrier in the roof, a truss with particular articulation and a black painted line, combined with light from windows high up in the south wall. I argue that this may have staged a protected zone, east of the middle. Altogether, even if the focus was on the altar, there was probably a sense of ‘west-east- and up’ dynamic in the room.

This chapter adds that the twelfth century architectures were site-specific. The ‘firm box and vivid top’ was related to the ground and the space above, it was placed. Further, experiences of architecture involve time, and some aspects become apparent in a sequence, with Unwin (2009:37); this is about discovery, approach, entry, exploration and memory. People

used their sites and nave-rooms and being there, outside as well as inside, they experienced the site and the architecture. To examine further I connect the interpretations of the ‘situated firm box and vivid top’ with modifying elements of architecture e.g. light, sound, texture, paths [along which one moves], views and space. I propose that it is possible to imagine some of what people may have experienced within this frame. The twelfth century church-goers were individuals with various experiences and ideas, and physical evidence cannot help answer questions about what the nave-rooms meant at specific times. Yet, being at a site or in a nave-room was to some extent a collective and formalized event. Ceremonial practices, interpreted from written sources, help contextualize the architectural interpretations. Even if no written source from the period in focus [1130s–1160s], relate specifically to the five churches or the region, later written evidence can cast at least some limited light on the situation. Most important are law-texts, for example the one from Västergötland. In this, I build largely on Nilsson (2004:87–172).

The subject architecture easily stretches in many directions. The remains of early medieval churches may be explored with various perspectives, e.g. building techniques, type and style, usage and practices, as well as what they represent or symbolize. Most of these can intersect with spatial and sensory aspects of architecture. It has been a challenge to narrow the scope. One way is to concentrate on a single church site. Thus, to manage, two of this chapter’s subsections [4.1 and 4.3] focus largely on one example, the church in Gökhem. As in many analyses of architecture (e.g. Shirazi 2014:157), this chapter invites to a kind of guided tour. It moves along the footprints identified by Unwin, from discovery and approach, to entry, exploration and, in a way, recalled in memory.

The tour starts outside the present churchyard’s north gate, on ‘Chapel Hill’ in Gökhem [4.1]. The attention is on the site, the immediate surroundings. A guiding question is to what extent the mid-twelfth century site-topography provided a pathway, a line to walk along to the entry, as well as a place for outdoor ceremonial activities in front of the entrance. To examine the entry we will take a detour and visit doorways and portals in stave churches in Norway [4.2]. My argument is that new investigations of these help contextualize the entrance situation in Gökhem, as well as the idea [from chapter 3] that walking under tie-beam- arches or gates may have been of importance. Thereafter the tour continues inside, to explore the nave in Gökhem [4.3]. The walk continues to the middle of the room, where it stops. From this point, I only look into the east half of the room. A guiding question is about; how the different elements of architecture [basic and modifying] may have worked together in the interior? Further, how does this connect to zones, activities and objects, known from written evidence.

In the sub-chapter [4.4], the tour leaves Gökhem. Here I seek to explore how an early medieval weaver recalled a church, in a visual version. This image occur in the early medieval tapestry from Skog. My questions in front of the woven picture are similar to those asked at the sites. However, here they are about what visual choices the artist made when picturing the church. Because the weaver envisioned the church interior inhabited, in active use, I also ask about what people do.



**Fig. 4.1.** The map shows the visited stave churches in Norway; Urnes [1131–32], Hopperstad [1132], Kaupanger [1137], Torpo [1163], Nore [1167], Uvdal [1168], Flesberg [1154–70] and Borgund [1184]. The map also shows the village Skog in Hälsingland, where the tapestry from Skog was found in the parish church.

Finally, [in 4.5] I seek to contrast the reconstructed mid-twelfth century architectures with how people subsequently changed them. Thus, the thesis comes back to the archaeological evidence in Forsby, Forshem, Gökhem and Marka. This is a tale of ‘the end of the tiebeam game’. I propose that people made re-creations in [at least] two stages, which ended in completely different interiors. A guiding question is how the altered architecture is different from the previous.

#### **4.1. ON CHAPEL HILL: SITE-TOPOLOGY<sup>1</sup> IN GÖKHEM**

My questions in this part [4.1] are about how the site’s topography related to the nave and its original doorway[s] in Gökhem. To examine further I search for, 1) possible entrances to the site and 2) areas with flat enough ground for people to gather and participate in outdoor

rituals. I view these two ‘basic’ elements of architecture, together with the entrances to the nave, as ‘nodes’. Between the nodes I look for 3) suitable connecting lines, routes, which I imagine people may have walked, for example in a procession. In addition, I ask about outdoor ‘modifying’ elements, such as skies or views.

I am again inspired by artist and architect Maya Lin, this time to pay careful attention to the subtle site-topography and its relation to the nave in Gökhem. One of Lin’s works is a church, the Riggio-Lynch Chapel, Tennessee [2004], which have similarities with the idea ‘situated firm box and vivid top’. The main body of the Riggio-Lynch Chapel recalls an abstract ship or ark, which is seemingly ‘beached’ on the ground at the edge of a pond (cf. Filler 2016:54). The ground plays an important part and is tangibly present in Lin’s works (cf. Brenson 2015:28f). With this in mind, I propose that the team in Gökhem carefully chose a suitable location. In addition, they likely cautiously and precisely placed the building at this site with awareness of how the nave’s entrances were to be approached. Thus, I seek to analyse the site’s topography and suitable walking routes to the entrances. New techniques offer new ways to examine. It is the scan of the site and church in Gökhem, which made this examination possible. The precise and detailed 3D recording of the surface topography connects the nave’s interior to the outdoors.

### **Introduction to the place called Gökhem**

The name, ‘Gökhem’, means, “homestead where the cuckoo is heard”<sup>2</sup> (Hernfjäll 2011:5). Gökhem is the name of a parish as well as a church-village located on a slope with a ridge in the landscape, a couple of kilometres southwest of a larger hill. Today this is a small village and parish, in 2015 about 600 people lived here. It is possible that Gökhem was a village or community also in the 1140s when the church was new, but it is also possible that it was not. No mid-twelfth century record provide evidence from here. However, less than a century later written evidence put the place and name Gökhem on the map, as a man from Gökhem, Thore Raefwaer, occur in the list of previous ‘law-speakers’ in the Older Västgöta law (Wiktorsson 2011b:193–195). Raefwaer is the third name on the list however, it is not clear precisely when he lived. It is probably safe to say that a man from Gökhem had an important regional position in the secular society in the early medieval period. Another record points to Gökhem as important also within the domain of the Catholic Church, as the congregation maintained a monk or friar [*kanik*] in the Skara Cathedral Chapter (Hernfjäll 2011:6). The first [listed] was Benedictus, in 1288, a priest in Gökhem (ibid). The place Gökhem stands out also because there were two buildings in masonry during a large part of the early medieval period. One was the present standing church. The other is now a ruin, located about 200 m from the church. The site was excavated and the ruin restored in 1957 (Fornsök Gökhem)<sup>3</sup>. Finds suggest that the building was in use for about 300 years, from the beginning of the thirteenth- until the beginning of the sixteenth century (Hernfjäll 2011:7).



**Fig. 4.2.** View towards west in Gökhem in 1938, when the site had less growth than today. Photo Lundberg 1938, ATA.



**Fig. 4.3.** View of Gökhem church from the present north main entrance to the churchyard, which was created in the eighteenth century. Photo 1945, ATA. There are a number of 'layers' at a churchyard and site (cf. Alexandersson 2014:35–56).

### Hills, water and continuity

The church in Gökhem is located in a distinct place. It sits on top of a small hill at a particularly steep part of the slope in the landscape. This is similar to the other five churches church-sites. They are also located on a slope or on top of a hill. The neighbouring Marka church was placed in the same way as in Gökhem, on a hill at the very foot of a southwest slope. Forshem church was located high up on a slope, overlooking the landscape towards southeast. Eriksberg and Forsby were both placed on small hills overlooking their surroundings. Thus, which was perhaps equally important, the churches are visible from a distance.

The church-site in Gökhem is located near flowing water. North and west runs a tributary to a creek [*Källarsbäcken*] and the names of places just south and northeast of the church [*Månsakällan* and *Källedal*], refers to wells or springs [*källa*]. The priest Lindblad who writes about Gökhem in 1780–1790s (ATA Gökhem), names these “Sante Månsa” and “Sancti Magni” and he claims, from hearsay, that baptizing was performed there before. Similarly, the other five sites are also near flowing waters or springs. Marka church is located between two inflows to a small lake [*Sjötorpasjön*], Forsby church in between two small streams that fork just west of the church [*Ösan* and *Lillån*], and Forshem church is near [*Sjöråsån*]. Gamla Eriksberg church is located near both a well [*Sankta Brittis källa*] and a larger flow, which runs into the river Lidan. These waters were certainly not flowing in exactly the same way 850 years ago; however, there was probably more water then, as surrounding landscapes were drained during the twentieth century.

Many churchyards in Västergötland may be from the eleventh- and twelfth centuries (Gullbrandsson 2008b:16). Many of these [c. 40] sites have a pre-Christian history (ibid:12). Forsby church has a notable pre-Christian continuity as it was placed right on the top of a 3 m high and 40 m wide rounded mound, which is probably a burial site from the Iron Age (Fornsök Forsby). Stone drywalls encircle the five churchyards today. It is probable that the border between a churchyard and its surroundings was defined with a proper fence already in the twelfth century (cf. Nilsson 2004:102). Early Christian graves were identified north of the present churchyard in Gökhem, and thus, the churchyard was perhaps larger than today (Hernfjäll 2011:35).

A scaled map over the village Gökhem, drawn in 1645 (Swedish National Land Survey, Historiska kartor Gökhem), provides a snap shot view of the church and site, almost exactly 500 years after it was consecrated into the Catholic Church<sup>4</sup>. At this time Gökhem's community [*socken*] had 16 farms. The church with yard is located in the centre of about ten farmhouses with fenced yards. Just north and east of the churchyard is a relatively large, not fenced space. I interpret this as an open community area. The priest Lindblad observes, in the 1780s, that north of the churchyard is a "forecourt" [*förgård*]. In this, he continues, is a permanently fenced place for the churchgoers' horses, wagons and sleds (ATA Gökhem).

The land surveyor visualized the churchyard in 1645. He gave the yard a rectangular shape, about 150 x 100 yards [*alnarum*] according to the scale at the bottom of the map<sup>5</sup>. The yard was slightly longer in the west-east direction. He drew the yard's fence with a thick red line, and he marked three distinct entrances, portals with little roofs, from north, east and south. He placed the north and east gates not quite in the middle, they are slightly to the northeast corner. There is no entry from west. He placed the church building in the southeast part of the yard. This may be a conceptual drawing of the churchyard, and the map does not show ground forms, the steep slope west of the churchyard is for example not accounted for. However, the picture fits the actual topography well.

The priest Lindblad comments on the Gökhem churchyard fence and its entrances, in the 1780s. The yard seem to have been arranged in the same way as in 1645. He calls the fence "the church-logs" [*kyrkobalkarna*], which recalls a churchyard fence made of wood. Such solid log fences are still in place at a few other medieval church sites, for example Södra Råda church, north of Västergötland but in Skara diocese. However, Lindblad adds, "or walls", which suggests that 'church-log' was a notion and the fence was really made of stone in the 1780s. He observes that the north and east portals has pillars of plastered limestone, but that the south entrance is made of wood. This suggests that the north and east entrances were more important, and perhaps more frequently used. Time travelling some centuries ahead, a map from 1965 (Swedish National Land Survey, Historiska kartor Gökhem) shows the church and yard, and still, with something like a 'forecourt'.

However, zooming in, some things have of course changed. Importantly, the entrance to the nave was moved, it is since 1775 through the north porch of the chapel in the late medieval period (ATA Gökhem). The significant pathway, which leads straight from the present

north yard gate to this door, was established in connection with this. The priest Lindblad describes it as a [new] straight, broad and even road [“våg”], which was laid out on a solid stone foundation with sand (ibid). This pathway is still in place, slightly raised from the surrounding ground, and it goes straight across the sloping ground, like a gangway or bridge. A site-plan of the churchyard from 1970 (ibid) shows the church building’s entrance through the [chapel] porch, and the path-gangway leading straight to the north gate. However, this plan also shows a second gate in the same north churchyard wall, further to the east. This entrance is on a slightly higher level in the ground, in fact, at about the same as the level next to the church. This second gate also fits well with the location of the north entrance in the map from 1645.

### **Outside: participate in ceremony**

The medieval churchgoers gathered outside their church in connection with Mass, yearly feasts or important events, for example christenings, weddings and funerals. They buried their dead in the church or churchyard. In connection with these events, people walked in processions in predetermined routes, and in and out of the nave. Memories of specific rituals and the stories told on Chapel Hill in Gökhem were probably connected with the physical surroundings.

At the consecration of the church, possibly in the year 1141 in Gökhem, the bishop arrived with his assistants from Skara to separate the Holy place-with-building from the rest of Gökhem. This was likely an extensive happening. In the early fourteenth century, in the region Sörmland in east Sweden, for example, the bishop had the right to come for three days with an entourage of twelve men and fourteen horses (Nilsson 2004:100). After the consecration, both place and church were a protected area. Moore (2000) writing about northwest Europe, points out that this place was often chosen for community events e.g. markets, meetings and the witnessing of important transactions, because armed men were excluded and people had the right to sanctuary (ibid:60). The area in front of the portal was in many examples related to trials (Deimling 2000:324). The sanctuary, the [churchyard] boundary was “by custom with a radius of thirty paces” (Moore 2000:60) [which is probably a little more than 20 m].

Likely, not all parts of church and yard were equally holy; the outdoors was less protected than the inside of a church (Nilsson 2004:101). According to the law from Hälsingland in north Sweden [*Hälsingelagen kyrkobalken*], written down 1320s, the outside around a local church included three zones [related to different punishments for crimes], 1) in the churchyard’s entry [*i ingången till kyrkogården*], 2) on the churchyard [*på kyrkogården*], and 3) in the church-door [*i kyrkdörren*] (ibid). This suggests that there was one particular main entrance door. However, in Gökhem, there were possibly three different openings to the nave, and which of these was the main is not clear. However, they were all in the west part of the nave. The ‘west’ was the entrance side.

The Abbess Hildegard of Bingen comments on the ‘west’ in the mid twelfth century. She viewed the west direction different from north, east and south in an account of a vision, titled ‘The tabernacle’ [part 3, in ‘Scivias’ I.4, The Trials of the Soul]. She writes,

In this tabernacle, therefore, towards the north, I set up a pillar of unpolished iron on which I hung small fans of various feathers moving back and forth. I found manna and I ate it.

Towards the east I built a fortification of square stones, kindling a fire within. Here I drank myrrh-flavoured wine with grape-must.

Towards the south, I made a tower of square stones on which I hung red shields; in the windows I placed trumpets of ivory. And in the middle of the tower I poured out honey and prepared a precious ointment of various spices, so that its strong fragrance permeated all of the tabernacle.

Towards the west, however, I did no work, since that part was turned towards the world (Hildegard of Bingen 2001:45).

Abbess Hildegard carefully focus attention on one capital direction at a time, and she finds that the west was turned towards the world. With the iron-clad doors in Gökhem and Marka in mind, it is also notable that she writes that the tabernacle “was made of the hardest steel” (Hildegard of Bingen 2001:44). Abbess Hildegard lived in the Rhineland, about twice as far south of Gökhem as Hälsingland is to the north. However, contrasting the regional laws that were written centuries later, she wrote this in exactly the same period the church in Gökhem was raised, as she started *Scivias* in 1141 and finished it in 1151 (Atherton 2001:lii). I argue that her written account supports the idea that the west direction, rather than south or north, was particularly important in connection with entrances. The west was important in relation to the entrance situation.

It was a practice to gather and take part in ceremonies in front of the church-door in particular in the beginning and end of a person’s life. The medieval evidence about christening assumes that it was children that were baptized (Nilsson 2004:129). Further, it was largely the same baptizing ritual, developed already in the third century, which was performed throughout the medieval period in the Nordic countries (ibid:129f). According to the guides given for the ritual, families and godparents came with the child to the church-door, and the first part of the ritual happened in front of this entrance (ibid)<sup>6</sup>. Even if this was only a preparation, it was a large part of the whole ceremony (ibid). After this, also those who should be baptized could enter the nave, and the ritual continued inside. It is uncertain when couples first began to get married in the church. Nilsson finds that weddings were perhaps not a church’ concern in the mid-twelfth century in Sweden, as a guide for the ceremony was not included in the earliest rituals (Nilsson 2004:136f)<sup>7</sup>.

A deceased person was blessed in a ceremony outside the nave entrance, before taken inside, likely on a stretcher, to the last Mass [*rekviemmässa*] (Nilsson 2004:146). The stretcher was carried out of the church again, after the Mass, for burial. Thus, people walked in a funeral procession both in and out of the nave. The grave may have been in the church, right next to the building outside, or further out in the churchyard. There were in addition a number of yearly feasts, and during these, people also walked in processions in and out of the nave. Crosses, relics or saints were carried, for example to bless the fields. Sometimes,





**Fig 4.4.** View towards west at the site in Marka, overlooking 'Odins hill' [Odensberg]. Photo 2015.

I imagine, the priest would lead his congregation, and clergy and laity walk together in a larger appearance, or other times, only clergy walked before the people (cf. Moore 2000:61). Processions of various kinds, small or large are, in my view, impressive and powerful drama. A procession with the purpose to walk around a property to claim it, in the early eleventh century in France, was described by Bernard of Angers [in the 'Book of Ste. Foy'],

[A] solemn procession of clergy and laity, who move forward with great formality carrying candles and lamps. A procession cross goes in front of the holy relics embellished all round with enamels and gold, and studded with a variety of gems flashing like stars. The novices serve by carrying a gospel book, holy water, clashing cymbals, and even trumpets made of ivory /.../, (cited in Moore 2000:21).

I find that the activity to enter and walk out of the nave in a long line was important, even if it was not the same to everyone or equally important each time. In addition, if there were three different doors, these may have been used for different purposes at different times. In any case, I propose that a place right outside the west-zone was significant, and that this should have a large enough, relatively flat and suitable ground [possibly but not necessarily in a porch], for a relatively large group of people, about as many as would fit in the nave itself. This place should also give appropriate access to pathways approaching the entrance. At funeral processions, this would be with a stretcher.

### Site topology

Hildegard of Bingen's idea that the west of the tabernacle is turned "towards the world" fits the interpretation of the nave in Gökhem, as its opening[s] was [were] originally located in the west part. Thus, people met in front of, gathered and walked in a long line through a doorway into the west end of the nave, heading towards east inside. The search here is for areas with flat, large enough places for people to gather outside. I examine the surface-topography at the site in Gökhem, looking for its character and possible places. Thereafter I seek to connect these places with routes from possible gateways. I look for suitable connecting routes, which provide comfortable walking on more or less the same ground level.

The site topography was visualized within the scanned large point cloud version of Gökhem church and site. Curved lines at 0.20 m equidistant were made visible. The scan picture reveals a number of characteristics. One is that the ground at the site forms like a 'peninsula' on a coast. It sticks out towards west, and ends at the steep dive in the east-west sloping landscape. The tip offers a view. The situation with church and bell tower recalls a lighthouse on the shore to the countryside below. Another characteristic is that the top part of the peninsula is only slightly rounded, almost flat. The flat part forms a plateau, which has an oval shape, about 30 x 15 m. The church was placed in the middle of this plateau.

The building was oriented, generally east west, and this is line with most early churches in Västergötland, for example in Gullbrandsson's catalogue (2015). I therefore assume that the building team in Gökhem were aware of the True north<sup>8</sup>, and how this could be identified. However, the church in Gökhem deviates somewhat from the north direction. Instead, the builders chose to adjust the theoretical direction a little, as they put the church in line with the peninsula topography. I interpret this decision, not to place the building perfectly in line with the winds, as that they chose to adjust their building to follow the ground. Further, they were probably attracted to the 'peninsula theme' of the site. I argue that they wanted to enhance, rather than to go against it. This also shows that there was some margin in the Church' demand to place a church building exactly east-west. The rule was not completely rigid, and the local building team was strong enough to act on this possibility.

The chancel and apse were put on top of a mound, a little hill on top of the hill. Part of this is probably manmade. Possibly, the apse, which is on the highest mound level [= zero in the model], is a subsequent addition. The foundation at the east wall of the nave was placed

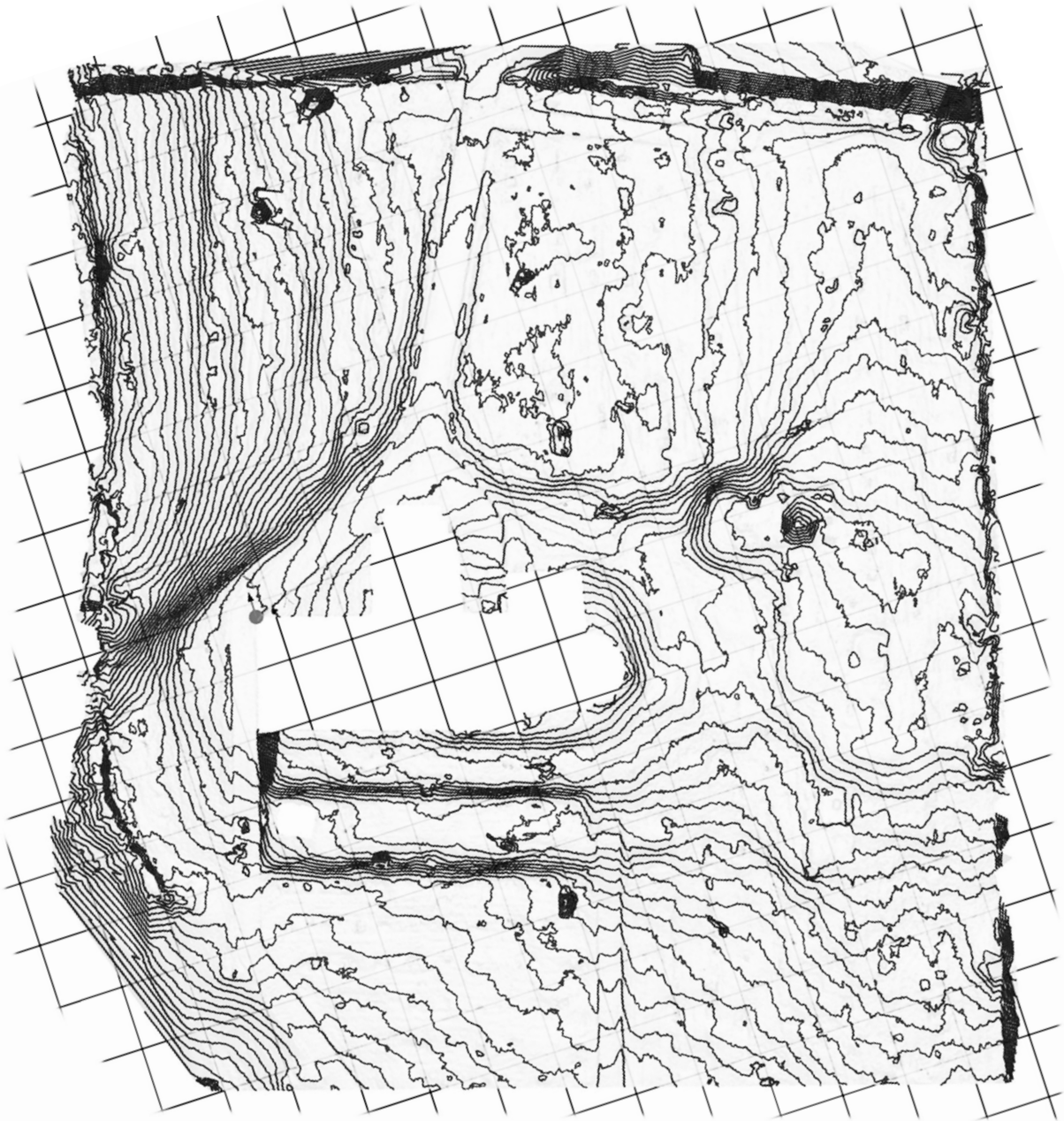
slightly lower than the chancel, at about  $-0.20$  m, and the original west nave wall, which is 12 m further west, is at the  $-0.60$  to  $-0.80$  m level. The original nave's west wall was placed about 12 m from the steep tip of the peninsula.

With the original chancel and nave in place, I identify three flat areas large enough for a 'group' of people to gather at, in the church's vicinity. These are at the  $-0.80$  to  $-1.0$  m levels. One is behind the chancel at the  $-0.80$  m level. This is an area about  $10 \times 20$  m. Another but slightly smaller flat area is north of the nave. This was outside the doorway in the north wall of the nave. It is the place where the medieval chapel was subsequently added on, in which the present entrance to the nave is located. Finally, a third area was located in front of the original west wall at the level about  $-1.0$  m. It is where the west extension of the nave [ $9 \times 8.5$  m] was subsequently added on. I have to reconstruct the exact size and level of this place, because the ground has been slightly rearranged. Today, there are e.g. two terraces towards south constructed in the twentieth century. Photos showing the church from south in the 1890s (ATA Gökhem), reveals that this was then not terraced, just one continuing slope towards south. This slope lands at the  $-2.40$  m level. In addition, the present west wall has been fortified in the 1920s.

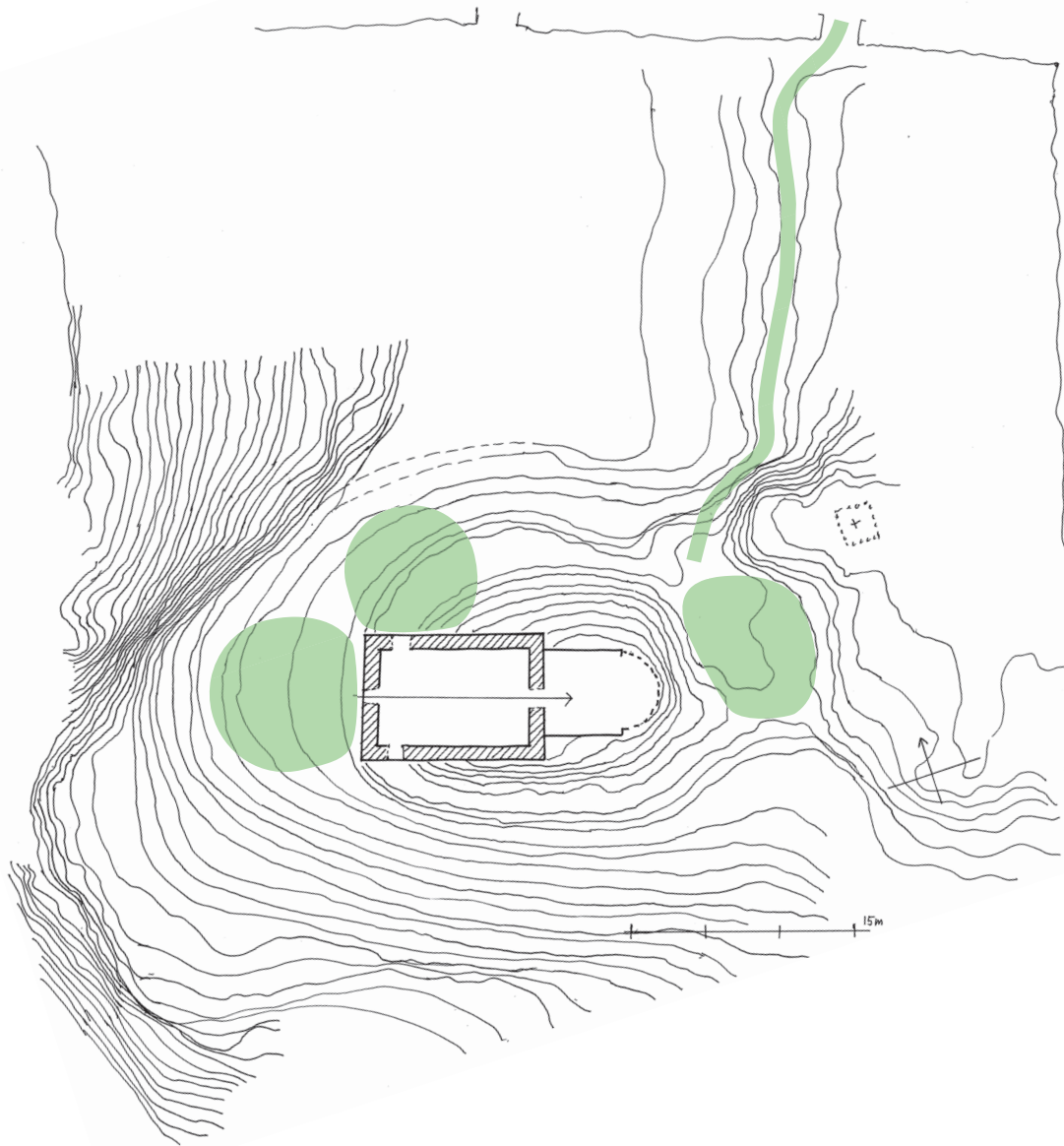
I propose that there were three entrances to the church-yard-site in 1140s, more or less the same as there were in the seventeenth century, in the map from 1645, and further, that there were indeed three doors to the nave. Thus, I find that the peninsula offers, three possible entrances to the site, three flat parts suitable to gather a group of people, and three doors to enter the nave. These can be combined with walking routes, some more practical and suitable.

If people approached the church from the northeast, they would likely walk in a curve following the level  $-0.80$  m. They would meet people who entered straight from the east and those that came uphill from the south, at the flat area northeast of the chancel. They could continue to the west side of the nave, and tip of the peninsula, by walking along the nave. On the north side, they would walk comfortably on a relatively broad flat path continuing on the  $-0.80$  to  $-1.0$  m level. However if they chose to walk along the south side, they would have to keep close to the wall in order to avoid the slope. A theoretical alternative would be to reach the south entrance by walking on the north side to the west place first, and turn around the southwest corner. Entering probably required a step or two up from the ground level.

When approaching the church today from the main north gate on the straight pathway, one hardly take notice of the topography. The site seem flat, and the pathway, which was constructed in 1775 (ATA Gökhem) invites and guides you directly to the door in the north porch. The straight broad path is at the  $-1.60$  m level. Its surface is above the surrounding ground on both sides. The ground was, before 1775, likely sloping more towards northwest, around the  $-2.0$  m level. However, if you approach the site from the old, northeast gate, you can walk along the same level ground, feel the peninsula shape, and discover and have a glimpse of the west view all the way. Then, the focus point and end of this site, is the place west of the nave, on the tip. The peninsula takes form and the view in a distance would pull you along towards the west. I argue that the flat place in front of the west door, even though



**Fig. 4.5.** A site plan of Gökhem church. The lines are at 0.2 m equidistant, the grid shows the capital directions. Spetz 2017.



**Fig. 4.6.** Site plan that analyses the theme 'peninsula', with the original nave and chancel. Three flat areas, 'places', 1) east of the chancel, 2) by the north entrance, and finally 3) west of the original nave are identified. The south route is narrow, close to the slope. The north route is more convenient. Drawing based on the scan by Spetz 2017.

not more than about 10 x 10 m, may not have felt small or tight. There was both little space and much space. The place was fluid, not ending. The whole [west] view was part of it. The site did not end in a corner; it continued into the world. The site in Gökhem was indeed open to the west. The two church sites Forsby and Marka have similar subsequent additions towards west as Gökhem, and thus they too, probably had a similar place next to the original west wall.

#### 4.2. ENTER: UNDER [MINIATURE] LATTICE TRUSSES IN NORWAY

New examinations of stave churches in Norway provides a context for the interpretations of the entrance situation. The purpose in this part is to deepen the understandings by connecting the trusses in Västergötland to a small number of similar, though much smaller ‘lattice tie-beam trusses’, which were placed over entrances. Traveling about 600 km north-west takes the thesis exploration to the four stave churches; Flesberg, Nore, Uvdal and Borgund, in Norway. The idea from the chapter on roofs [3], that lattice tiebeam trusses may have been an important part of the articulation of entrances, both comes from, and leads to questions and investigations in stave churches in Norway. Now, early medieval churches in Norway do not have roofs with common-tiebeam lattice trusses (cf. Storsletten 2002b). Yet, during a visit to Borgund stave church in 2015, I noticed that the three entrances to the gallery have archways [*skruu*] (Christie 1993:47), which are formed like lattice tiebeam trusses. They are indeed quite similar to the ones in Forsby and Gökhem. They have a tiebeam and rafters forming a triangle, braced by six crossing straight struts, set in a fan like shape. Only, they are miniatures. Like the rest of the exterior in Borgund, they are covered with black tar.

The nave in Borgund was raised around 1184 (Thun et al. 2016:109) and it has two entrances, from west and south. These are marked with portals, which have famous intricately carved planks. The main, west portal is most richly decorated. The south portal is smaller and less decorated. Stylistic analyses suggest that the portals are contemporary with the nave (Anker 2005:150). The surrounding gallery is about 1 m wide. The doors to the nave are located just inside the entrances to the gallery. However, what about the gallery in Borgund, did they build this in the 1180s too? On the one hand, it is possible. Christie finds that original galleries surrounded the two stave churches Nore and Uvdal, as their respective foundations were connected (Christie 1993:47). Dendrochronology dates both these churches to the 1160s, Nore [1166/1167] and Uvdal [1167/1168] (Thun et al 2016:101f). Thus, the idea to make a gallery may have existed in a nearby region at the time. On the other hand, Bjercknes (1944)<sup>9</sup> finds that the gallery in Borgund was a subsequent addition. He argues that the interior in the nave is firm and matter-of fact like, and that the forms and decorations in the gallery are different<sup>10</sup> (ibid:32). Hauglid too finds that the “galleries /.../ [in Borgund were] added in the Middle Ages” (Hauglid 1990:10, 104). Bjercknes points out that the gallery in Urnes is similar to the gallery in Borgund (ibid:18), and reasons, based on existing water-holes in the naves’ swills in Urnes and Hopperstad, that their earlier galleries were added subsequently (ibid:18)<sup>11</sup>. The remaining west gallery in in Urnes consists of parts from



**Fig. 4.7.** **Left**, the entrance to the gallery in Borgund, and **right**, the bell tower in Borgund. Both have 'lattice' grids. The bell tower in Borgund is the only freestanding tower with stave construction in Norway (Anker 2005:151). The bell tower in Lomen stave church, also have lattice, see picture in Hauglid (1990:59). Photo 2016.

different periods; the arch over the entrance, which is formed like a small truss with a collar, is subsequent (Christie 2009:166).

The church in Borgund was identified the "old /.../ stave-building with gallery around"<sup>12</sup> in 1722 (Dietrichson 1892:284), and the gallery appears, under visibly old roofs, on a photograph taken "pre-1870" (Pedersen 2016:170). The lattice truss over the southern entrance is noticeable in a nineteenth century drawing by Schiertz (ibid:168). The information 'pre-1870' is important because that is when the church was restored with the intention to bring its 'original form' back (Dietrichson 1892:284). In this process subsequent parts for example windows and vaults, were abolished (ibid). Even if Dietrichson does not mention that parts of the gallery were taken down or replaced they could well have been. The present gallery may of course be composed of parts from different times. Unfortunately, no part of the gallery has been dated with dendrochronology.

Yet, with Borgund in mind, I propose that the idea, 'mini-lattice trusses over entrances', could perhaps take questions about the twelfth century entry to the nave in Gökhem further. I argue that the doorways under mini-lattice trusses may have been important parts of the entry in Borgund. If so, this suggests that lattice trusses were phenomena a visitor would, or perhaps even should, pass 'under' when going from the outside to the inside of a nave. Further, I note that the setting in Borgund combines straight crossed lines, which form

strict geometrical rhomboids, with winding animals and plants carved in the portal below. This is somewhat similar to the situation in Gökhem, where the most western truss have straight struts, but all the others have curved and decorated lines. I was curious if there were other such little trusses attached to stave churches in Norway. A preliminary search was performed 2016, and the examinations were carried out together with my colleague, buildings archaeologist Jan Michael Stornes. We visited nine stave churches together, Urnes [1131–32], Hopperstad [1132], Kaupanger [1137], Torpo [1163], Nore [1167], Uvdal [1168], Flesberg [1154–70], Borgund [1184] and Rollag [1466] (Thun et al 2016).

### **Nore and Uvdal**

The west entrance to the nave in Nore is in its' original place. The composition and motives in the portal planks belongs to a group, the 'Sogn-Valdres' portals<sup>13</sup> (Anker 2005:192). Anker finds that the carvings in Nore are similar to both the west portal in Borgund<sup>14</sup> (ibid:150), and in particular, to the west portal in Flesberg stave church<sup>15</sup>. The two portals, in Nore and Flesberg, are interpreted so alike that perhaps the same master carved them (ibid:192). Dendrochronological analyses in Nore, which date the nave to 1166–1167, supports the stylistic dating of its' portal (ibid:196). However, the portal in Nore is no longer complete, nor in full view. The present subsequent door is wider than the original opening, and part of the carved planks on the sides were cut off to make it fit. In addition, the added on porch ceiling hides part of the portals' top.

Stepping through the doorway into the nave in 2016, and looking up at the inside of the [same] west wall, there is a raised gallery. The gallery leads to a small attic space, right over the ceiling in the porch. From here, it is possible to see the top of the west gable wall, which was originally towards the outside. This is straight over the west entrance and portal below, and this is where we could observe a miniature truss attached to the boards in the gable. This small truss, about 2 m wide and 2.25 m high, has a tiebeam, rafters and ten crossing straight struts. It is coated with tar. Thus, hidden above the ceiling in the porch, is the miniature lattice truss, which in fact still crowns the portal below.

The present west wall in the nave in Uvdal church is not in its' original location. This is because the nave has been enlarged towards west. Anker finds that this change probably happened already in the early medieval period (Anker 2005:204). In this process, we noticed, the builders moved both the original [vertical] wall planks and [horizontal] plate. However, they let the top gable remain.

The composition and motives carved into the portal planks at the entrance, does not resemble other portals in Norway (Anker 2005:204). Instead, the decorations resembles a portal in Blomskog, in west Sweden (ibid). Anker dates the Uvdal portal stylistically to, from the mid-thirteenth century, to some decades into the fourteenth century (ibid). Thus, the decorations may well be contemporary with the enlargement of the nave. Dendrochronology dates the original nave to 1167–1168 (Thun et al 2016), the year after Nore church was raised, and at least a century before the enlargement.





**Fig. 4.8.** **Above**, the most likely original miniature lattice truss in Nore stave church, which is located over the west portal however, hidden by the subsequent ceiling in the present porch. **Below left**, portal carvings without subsequent paint, that are also located over the ceiling, and not visible from the porch. **Below right**, the top of the portal carvings that are visible in the porch. Photo 2016.

We could not observe the former outside [towards west] of the gable, as this is hidden behind newer boards. However, a raised gallery in the nave provides access to a small opening leading to the attic space over the nave, and from here, the inside of the original west gable [i.e. towards east] is visible. This has wide boards, and, through some gaps at the very top, we got glimpses of crossed struts. These suggest that a small, miniature lattice truss, quite similar to the one in Nore, was attached on to the former outside. We could see that it was coated with tar. The truss is located straight over where the original entrance once was. The former outside of this west wall, i.e. the bottom part, which was moved, is not only visible from the present porch. We could see its hidden top above the ceiling, from the porch' small attic. We observed there the black outside of the original horizontal plate, as well as strut ends, the small lattice truss bottom. It seems the carpenters cut the wall off just over the horizontal plate, and did not bother to take the slender miniature struts down. Thus, we could identify both the top and the bottom of a miniature lattice truss, which likely once crowned a previous portal below. The main roof trusses over the nave in Uvdal were not constructed with lattice. Instead, these have a collar, which was decoratively formed, and decorated with black paint. Dendrochronology dates these to 1167–1168. This shows that carpenters in Uvdal probably made both a [miniature] lattice truss over the portal and other decorative trusses with rafters and curved collars, in the 1160s.

The present west entrances to the naves in Nore and Uvdal have portals with intricately carved planks. They belong to a group of documented [130] portals from 80 churches in Norway (Anker 2005:15), where a large number [75], consists of thick planks (ibid:38f). Today these occur in standing churches as well as in museums. The portals have been key in research about stave churches. The interest in portal research focuses the carvings. Analyses show that they relate to portals of stone in both Norway and England (ibid:62f), and there were likely relations to other Scandinavian makers of wooden portals (ibid:162). Most researchers interpret the carved motifs as [originally] meaningful (ibid:62f), however, they may have had more than one meaning at a given time (ibid). The questions here, about if there are small lattice trusses placed over entrances to naves in Norway, have not been in the focus of attention in previous research. Even if this issue needs to be taken further, the evidence from Nore and Uvdal strongly suggest that mini-lattice trusses were part of the entrance setting in the 1160s, and perhaps also in other churches, as for example in Borgund in the 1180s.

The church portals separated the outside from the inside. Thus, lattice trusses were perhaps also a phenomena a visitor would pass under when going from the [profane] outside to the [sacred] inside of the nave (cf. Pedersen 2016:171). I interpret that the trusses were an important part of the articulation of the entrances. Further, the connection to portals and entrances supports the idea of lattice trusses arching over a pathway, as in 'gates'. Moreover, straight canted crossed struts appear within the same situation as intricate and curved forms. Thus, the most western truss in Gökhem may be part of an entrance situation. The connection to entrances, door-path-ways and portals, implies that the triangular truss with crossed lines originally was about something more than just decoration. However, ideas change;

there was likely soon a difference between the first intent(s) and later interpretations. The fact that the builders cut the lattice truss in Uvdal in two, when they moved the west wall about a century after it was raised, points to a rather quick change of mind.

Writing this, I want to underline that this was a preliminary search. At first, our search was quite open, as we looked around. In Rollag stave church [1466] (Thun et al 2016:100f) for example, there is a slightly different, but still, like a small lattice truss, in full view over the entrance to the sacristy. Christie dates this porch to around 1700 (Christie 1993:115f). However, the truss could, of course be older and reused, or the articulation could have been reiterated. Further, after we identified the lattice truss over the original west entrance in Nore, we looked more systematically, and we would not have found the small traces in Uvdal if we had visited Uvdal before Nore. With this in mind, it would perhaps be worthwhile to revisit Flesberg in the future.

#### 4.3. INSIDE THE NAVE IN GÖKHEM

My questions here [4.3] are about how different elements of architecture may have worked together in the interior in the mid-twelfth century. To examine, I combine the interpreted elements of architecture, the ‘firm box with vivid top’ in Gökhem with modifying elements, and mainly this is about light. However, first I ask about ceremonial activities. I ask what people did do, in the nave. In this, I depend largely on Nilsson (2004).

Mass was the most frequent event. A Sunday Mass included; confession, offering of bread and wine, and a ‘todays’ text. The priest sung [epistle and gospel], prayed, distributed Communion with bread and wine, and finally, blessed the congregation (Nilsson 2004:107ff). Mass was structured in the same way each time, it was a repeated routine. In addition, on weekdays, the priest conducted everyday Mass and evening-, night- and morning song (ibid:134). Moreover, the churchgoers participated in important events, for example yearly feasts, in particular Christmas, Easter and Pentecost. They worshiped saints on particular days, for example Maria [*Marie bebådelsedag*] and angels, for example Gabriel, Michael and Raphael (ibid:112). Rituals handled the beginning and end of a Christian life. Children were baptized (ibid:131), and the ceremony was performed next to the font, which contained blessed water. The ritual was, according to later evidence, extensive (ibid:131). Bells were rung when a person had passed away [*själaringning*] (ibid:144) and the last ritual was a Mass [*rekviemmässa*], which in order to obtain eternal rest, was initiated with the sentence “Requiem eternam dona eis, Domine” (ibid). As put forth above, the dead body was most likely carried in and out of the nave on a stretcher. People probably also visited the church for private devotion and worship, and they were expected to confess at least once every year, at Easter (ibid:134, 109). Nilsson finds that there were altogether a very large number of events, in addition to Sunday Mass, perhaps sixty to a hundred days each year, or even more (ibid:112). I interpret that the church was a busy place, and with bells ringing at all events, also a loud place.

The ceremonial activities related to settings in nave-room. The law from Hälsingland [1320s] cast some light on this, as it puts forth two places in the nave, after ‘in the church-door’ [*i kyrkdörren*]. The first stop is ‘by the baptizing font’ [*vid dopfunten*] (Nilsson 2004:101), and I interpret that the baptizing ritual had a fixed place inside the nave, ‘by’ the font, even if the text does not give an exact position. The second stop was all the way across the room to the east wall, ‘in the opening to the chancel’ [*i öppningen till koret*] (ibid). Thus, there was an opening, not a door, to the chancel. Yet, the text does not say how big, or if this had a screen. The entrance ‘door’, ‘font’ and finally ‘opening’ to the chancel, were important stops in a sequence.

Both priest and congregation were likely active during the ceremonies. They were moving together in a long line, in processions. The priest acted singing, praying, and making signs. He was holding babies and holy stuff. Reading aloud and telling stories. The congregation, in an account from the fifteenth century, was required to stand up, sit down [there were by then benches], kneel and bow, and make the sign of the cross at certain stages during a ceremony (Nilsson 2004:109f). The churchgoers in the twelfth century were likely active too, singing along, praying, kneeling, answering aloud and making signs with their hands. Nilsson underlines that it was important to be present personally, as an individual was “influenced spiritually” just being there (ibid:109f). Women and men were separated in the nave, women occupied the north side and men the south side (ibid). This means that the cardinal directions helped control the different worshippers’ position in the room, and thus their experiences. The idea of cardinal directions, not only created a sense of ‘west-east’ dynamic between the long walls, but also a ‘north-south’ social geometry. Hence, there were gendered relations to zones or focus points, like the font in the nave, or the opening to the chancel with altar. Further, this organized who took part alongside each other, and who was opposite, face-to-face (cf. Unwin 2009:145).

The written laws and manuals give a picture of routine and order. However, perhaps not everything went according to plan at all times, and events had to be improvised. Bernard of Angers [in the ‘Book of Ste. Foy’], gives a lively account from the early eleventh century France. Bernard observes that during vigils in Ste. Foy, illiterate people who could not join in the chanting of psalms, were allowed to “relieve the weariness of the long night with little peasant songs and other frivolities” (cited in Moore 2000:26). Asking why, the Abbott told him that the monks had tried to forbid “the unsuitable commotion made by the wild outcries of the peasants and their unruly singing” (ibid) as they were unable to enforce silence during services. They had ordered the doors of the church closed at night. However, people were “shouting and demanding that they should be allowed to come inside the walls of the monastery” (ibid). One night a large crowd of pilgrims, helped by a ‘miracle’, appeared inside the closed walls anyways. The Abbott continues, “when we rose in the middle of the night for matins we found the church so full of people keeping the vigil that each one of us had difficulty forcing his way forward to his own station” (ibid). After this, the Abbott had reassessed his attitude saying,

[O]n account of the simplicity of these people an innocent little song, can be tolerated somehow. For it may be that if this custom were abolished the crowds that frequent the sanctuary would also disappear. Nevertheless, we should not believe that God rejoices over a little song; it is the hardship of keeping the vigil and the good will of simple people that please Him (Moore 2000:26).

Moore, discussing miracles, finds that in this example the miracle helped the community to reconcile the disagreement, and that the leaders adjusted themselves to realities of social power (Moore 2000:26). In the context here, of what people in fact did in the nave in the twelfth century, this example is a reminder that rituals may not always have been as orderly as they were described by clerics, centuries later.

Nevertheless, even if there is a lot of uncertainty, the written evidence provides glimpses of how people worshipped in the mid-twelfth century Västergötland. Because people came to church frequently, their experiences of the architecture interacted with the repeated routine, the memory of approaching, entering, and being and moving around inside the nave. People would probably ‘take possession’ of the room rather than experience it a new each time (cf. Pallasmaa 2012:67f).

With Unwin (2009), I propose that the walls and roof in the nave in Gökhem were ‘modified’ with light from windows and doors. The light would break up the volume and/or create a sense of a separate space inside it. This could also be for example sound from bells or a scent, fragrance from incense or smell from oil lamps, which created a particular feeling of space in a part of the nave. The idea could be taken further. I could imagine touch or sensation of skin in the nave, for example slightly sprayed, or dipped into water. Even taste, of for example unusual drink such as wine. It could be about holding hands and performing signs with fingers, and more poetic, witness holy acts and imagine wonderful strange things. The philosopher Gaston Bachelard (1994) sketches the scope. He describes first, in my reading, basic elements of architecture,

A house is first and foremost a geometrical object, one which we are tempted to analyse rationally. Its prime reality is visible and tangible, made of well hewn solids and well fitted framework. It is dominated by straight lines, the plumb-line having marked it with its discipline and balance (Bachelard 1994:47f).

Thus, a room is a body and volume, which is possible to observe measure and calculate, and Bachelard puts forth that on the one hand, “a geometrical object of this kind ought to resist metaphors that welcome the human body and the human soul” (Bachelard 1994:47f). However, he finds on the other hand that,

/ ... / transposition to the human plane takes place immediately whenever a house is considered as space for cheer and intimacy, space that is supposed to condense and defend intimacy (ibid).

Now, this transposition went too quickly for this study. Analyses based on interpretations of basic- and modifying elements of architecture cannot help answer questions about imagined dream worlds or what the nave in Gökhem meant to different people at specific times.

Instead, I argue that this examination of elements in design and possibilities for experiences, finds itself somewhere in between Bachelard's two opposites, the physical object of stone and wood, and the 'human plane'.

Both basic- and modifying elements of architecture are physical; they exist and can be observed and measured, though in different ways. However, brought together the various physical elements form relative, specific situations, for example, precisely how the light shines in through a window. Thus, with geographer David Harvey, the various elements are "relationship[s] between objects which exists" (Harvey 2006:271f). Hence, the search here is for relations, which are hard to measure, and in addition, it is about relationships between objects that exist [complete or only in part] and elements that may have existed in the past. However, I argue that it is possible to imagine some visual things, for example 'light in the past', as light [of some sort] came in from a window, which [I interpret] existed 850 years ago. A flickering candle flame can be imagined. Though, for example sound, scent and touch, may prove more challenging. Further, people moved and took different positions in the room at different times. Each position is important for the relationship[s] between the elements and gives a different version, for example of how the sun came in through the window at a certain time. The nave-volume in Gökhem thus provided a multitude of possibilities for experiences. It contained a number of directions, the four horizontal directions, vertical directions and a sense of forward [towards east], centre or middle, central axis, this side and that side, or before and after. The volume could perhaps be experienced tight or large, enclosed or open in the relative situations. I could go on. To cope, the chapter invited to a guided tour in Gökhem. I have approached the nave and come to the entrance door in the west side. Now I enter and the tour continues inside.

### **The open west for entrance**

The tour continues inside as we enter through one of the doorways in the west part of the nave. I have suggested in chapter two, that there were probably three doors in Gökhem and that these were located in the very west end of the room. The main entrance would have a proper portal. I have put forth that this could be the preserved heavy wooden ironclad door with a stone portal, which is still the main entrance, but which now is in the north chapel. People created the entrance-zone for the activity 'to enter the room' or of course, to leave the room. A doorway is a powerful architectural tool as it organizes space in opposites and contradictions (cf. Unwin 2007:3f, 205f). By positioning people and taking them along predetermined routes, doorways arrange the impressions, and organize what can be seen (ibid). The task, in the twelfth century, was to allow passage between outside and inside in the west end of the cave-like room, or not. Passing could be a challenge or a reassurance. The preserved huge lock on the inside of the wooden door, and the ironclad outside were important signals. Enemies could be stopped. Lock and iron remind every passing person of the possibility that this door may not allow passage. It could be shut, even locked. Some may pass



**Fig. 4.9.** **Left**, looking from the nave back towards the west entrance in the eleventh-twelfth nave in the church San Miniato al Monte in Florence, photo 2015. **Right**, west entrance zone in Hopperstad stave church. Photo 2016. The examples gives an idea of the contrasting light in the west entrance-zone.

through and some may be excluded (cf. Unwin 2007:205). It was a harsh reminder of possible otherness. The entrances to the nave thus probably influenced people's sense of identity.

The twelfth century concept for entry was a play with contrast and light. The activity, 'to enter the nave' focused entirely on the west end of the nave and was direct; it opened for direct entry in a dynamic, almost fluid, setting. The entrance zone could be both utter openness, if all [interpreted] three doors were open, or completely closed. The place in front of it was a fixed point on the ground under the sky; people had a view of where they were in the surrounding landscape, it was a view-point.

I can imagine myself take part in this. It would probably not be possible to hurry inside. The relative darkness in the nave-room would make me hesitate. There was perhaps a high threshold, like there is still in the doorways in Hopperstad stave church [1132] in Norway. If so, a visitor would have to climb over, to step in. A threshold makes you to stop the motion walking forward somewhat. Walking in a long line, as in a procession, or a group of tourists in Hopperstad, it takes quite a while for a number of people to enter. The procession slows the pace. I interpret that the nave was likely entered slowly.

Well inside I stop to get used to the relative darkness that contrasted the bright daylight. If all three doors were open, the entrance zone and floor, made of wood or stone, would be flooded with daylight from north, west and south, and the rest of the room would seem even darker. The strong light from the doors would create their own light-space, and help define the entrance zone. I interpret that the nave's entrance zone, just as the 'meeting place' outside the west wall, was characterized by both a conceptual and experienced 'openness'. There was a possibility for both little space and much space, depending on if all three doors were opened or closed.

Taking two or three steps straight into the room, I am in a position precisely between all three doors, and thus in a crossing, the intersection between the four cardinal directions. Looking up at this point, this is where the two trusses [2 and 3] meet with their fronts face-to-face. The narrow shaft [35 cm wide] between them goes across just before the two north and south doors. The dominating direction was perhaps west-east, from the place with a view over the landscape, through the door, towards the altar with relics in the east. The south-north direction was likely secondary as it went through doorways with less stunning views and because you would have to turn to get into the west-east direction. The fourth direction would be straight upwards through the face-to-face shaft above. Hence, I interpret that the entrance-zone was not in a corner, as it may seem to us visiting Gökhem today; the nave was connected to the four winds, views, and sky.

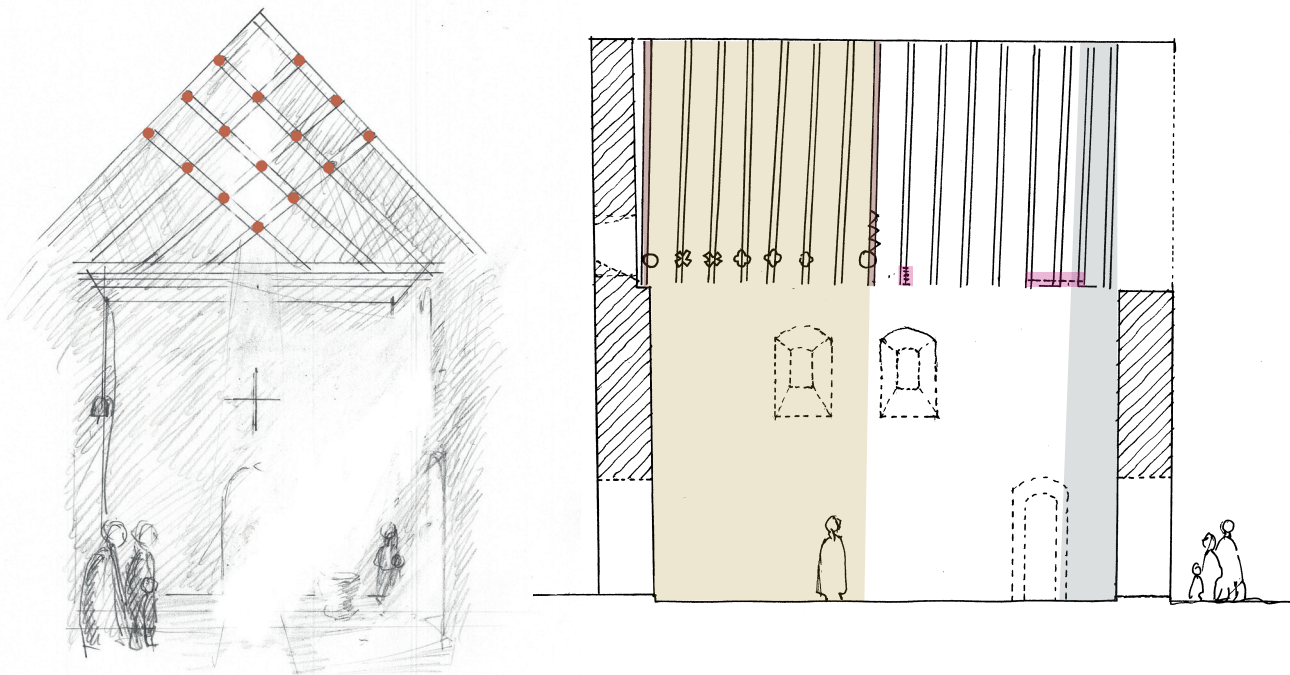
Zooming in for more detail, the south and north doors and the pathway between them were placed in line with truss number three. This allows for entrance just on the east side of the face-to-face shaft above. Walking through either of these two doors, a person could enter directly into 'the part of the room where trusses face west'. Further, the traces from something[s], which I have interpreted as 'hanging' from the tiebeams, occur by the north wall, straight over the pathway between north and south. This could be e.g. bells ringing, containers with incense, or the top lid for the font, which was hoisted up and down. Sound and or fragrance. In any case, the traces may mark a specific activity that took place here. The notches are set on each side of truss number three. Thus, the attachment is set on both the side with trusses facing east, and the side with trusses facing west, which supports the idea that this is a border, a psychological barrier of some kind.

### **In the northeast zone and towards the middle**

Slowly, eyes adjust and I see the room and venture a few steps further in. I take my gendered position in the northwest zone of the nave. I share this alongside sisters, mothers, aunts, girlfriends. Perhaps my children are here too. Between us and the southwest zone, is likely the pathway that heads straight east through the room.

The two small windows set next to each other high up in the south wall, on a diagonal from my view, draw attention. Marka and Forshem, had openings in their east gables, which would have drawn attention in a similar way. All the light-beams aim at the middle. The light pulls along the room, forward to the southeast and upward. There is light in the opening to

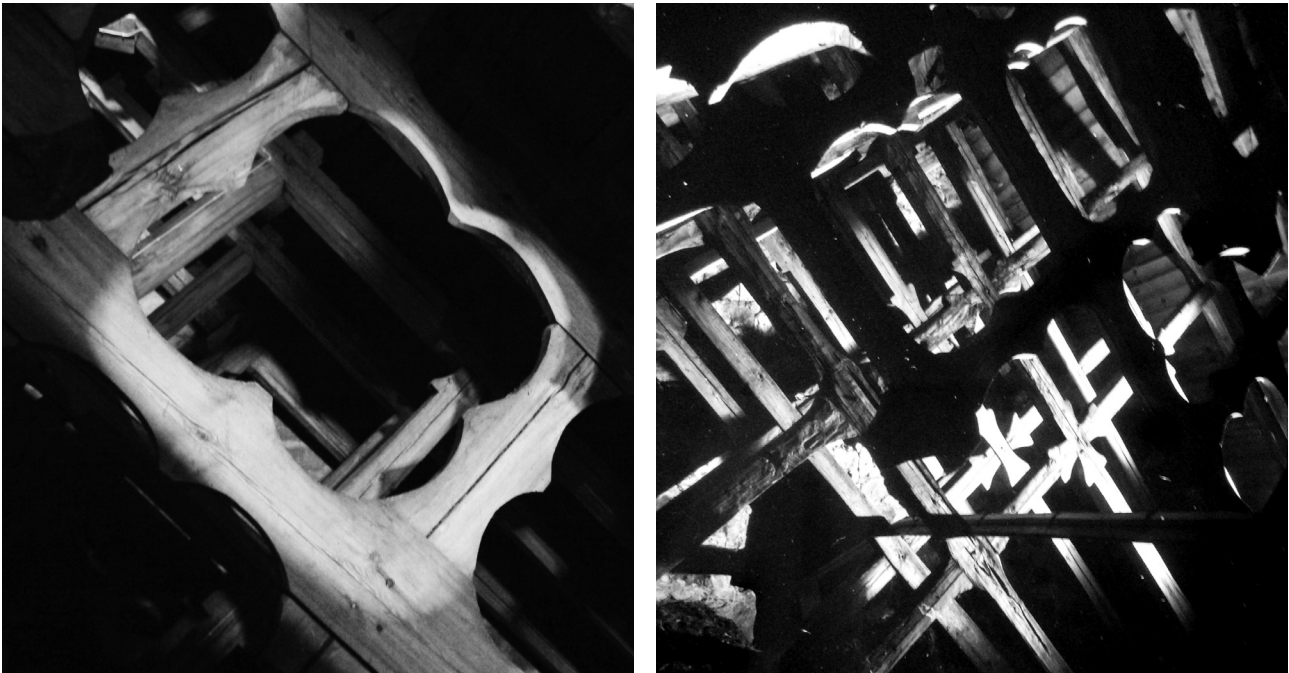




**Fig. 4.10.** **Left** the room viewed from west. The vivid roof was viewed from below. The eyes are drawn towards the light diagonally across the room, in the southeast and high up. **Right** the beam with the black line marks the middle. Sketch and longitudinal section based on scan 2017.

the chancel, ten meters straight ahead. Perhaps I would see a glimpse of the altar with the most holy stuff. Looking up, the height is notable. The walls in Gökhem were visibly higher than they are today [as they have now vaults]. They were over seven meters, and thus the room's volume was slightly higher than wide. The volume was standing. I see the roof, all the many tiebeam 'gates', this time from underneath, instead of climbing around in them. If there was a window in the west gable, the trusses' fronts would be lit with a direct beam of light.

I continue a little further into the room and approach the middle, which is less than 5 m from the west wall, and only a few steps from the south and north entrances. Looking up, the fancy trusses over the middle, painted white with iron nails shaping a diamond, catch the eye, as they were lit by the window. I notice the fancy beaded bottom edge of the tiebeams. The truss over the west window is the beam with an ambiguous trace, right under the ridge, which I interpret was from a hanging-attachment, or perhaps, a small wind eye. The tiebeam and possibly something hanging would interact with the window and strongly mark the middle. If so, bright light possibly came both from up above the middle and from south, into



**Fig. 4.11.** **Left**, trusses with quatrefoil in Gökhem. Photo 2012. **Right**, trusses with cruciform in Gökhem. Photo Klasson 1967 ATA.

the room's very centre point. As mentioned in chapter three the roof in Forsby could also point to the same. In any case, I find that beams of light probably defined the middle, and thus, I interpret that there was a kind of 'openness' in the middle just as in the entrance-zone, however, the middle was open upwards, to the sky above.

The baptizing ritual may have had a fixed place in the nave, the place called 'by the baptizing font' in the law-text from the 1320s. In Gökhem, the font itself is most likely preserved. It would be one of the two, which remain in the church today, which are dated to the twelfth- and thirteenth centuries stylistically. Both fonts are made in sandstone, and heavy. They were not easily moved, and likely had an established place in the room. However, the text gives no clue to a position, and archaeological evidence from the mid-twelfth century is, to my knowledge, largely lacking. The font would probably not be too far into the room, at least not past the middle 'barrier'. I imagine that the baptizing place would catch attention viewed from the entrance-zone. I propose that it was a focus-point, and worked like a 'heart' or, as the Latin word 'focus' suggests, 'hearth' in the room. I argue that if the font was placed for example in a sunlit position, this would catch attention and the water would be sparkling. I suggest this place could be similar to one possible suggested in Torpo stave church [1163] in Norway. There, in the wooden floor in the nave is a small hole, with a well-fitting little lid. The floor planks are likely original, but not dated. I interpret that this was an arrangement



**Fig. 4.12.** The stone relief placed over the west entrance in Forshem church. The church seems to be a small 'model' of a church building, which is placed at the feet of a stonemason at work. Photo 2015.

to let blessed water out in the ground. Thus, it hints to a baptizing place. The hole is located on the south side of the room a few steps east of the entrance in the south wall. The place was probably lit by a small window put in the south wall. The opening is still there, even if it was subsequently closed with boards. In Gökhem, there are possibilities for a similar place on the south side of the nave. However, it is not impossible to imagine something of the same on the west wall, even though this would be in the 'entrance-zone'. Another possibility for a baptizing place would be in the very centre point of the room. The north side, I argue, were there is no accounts of any window, seems less likely.

#### **The protected east-zone**

The next truss [9], on the east side of the middle of the nave-room in Gökhem is different. The truss marks the place in a number of ways, a beaded edge, a black line, a scar from lightning, and perhaps most important, a number of circular discs inserted in the lattice, in tandem with the truss next to the east wall [16]. I argue that this truss across the room was a barrier, powerfully argued and not easily crossed.

On the other side in the east, there is an abundance of light. My guided tour does not have to dare cross the black line; I can see it all from here. The second original window was

set a little more than a meter east of the first, at the same height. Together they provided a large light far into the room. Looking up, five of the six trusses have fancy cruciform shapes. The intricate patterns would be visible in the light; there was a play with shadows.

As stated previously, in chapter [3], I have not been able to find traces in the roof that would suggest a connection to something in the room below. Side altars for example, in the northeast [Maria?] and southeast [Patron Saint?] corners of the nave. The wood above give no obvious clues. Perhaps there were no side altars this early, during the period when the roof was visible?

There were probably some objects in the nave in Gökhem in the twelfth century. Perhaps wooden sculptures of e.g. Maria or a cross with Christ, like those in Forsby. A church like Gökhem probably also had woven textiles. Franzén & Nockert (1992) finds it likely that most churches' walls were, early on, covered with textiles [*tjeld*] (ibid:91). Later the textiles were mainly used in the chancels (ibid). There may have been a few other things too in the nave. The Older Västgöta law [1220s] mentions candlelight, 'in the back' [which I interpret would be in the nave], and bells hanging inside [which would fit with the trace in the north-west corner in Gökhem] (Wiktorsson 2011b:11). Some things, I assume, were kept in the chancel, for example reliquary, crucifixes and vessels. In addition, there would be liturgical books, for example a Missal (Nilsson 2004:107f). The Older Västgöta law mentions a vestment (Wiktorsson 2011b:11).

#### 4.4. A CHURCH TALE IN LINEN AND WOOL

This subchapter [4.4] develops a different perspective on the early church architecture. Here the focus is on early images of churches instead of real buildings. The aim is not to provide an overview of such depictions, and the search is not for further evidence of twelfth century building practices, that is, if the maker had a 'real' church building as a role model. Instead, my focus is on visualized elements of architecture, or aspects connected to this. In particular, I seek to explore the visual choices that the weaver made in a well-known medieval textile, the Skog tapestry [*Skogbonaden*]. Because the weaver envisioned the church interior inhabited, in active use, I also ask about what people do. I propose that there were connections between the textile craft, textile objects, church interiors and church architecture.

##### Church façades carved in stone

In this part, I build on literature to highlight two well-known early images of churches in Sweden. These are reliefs carved in stone, one is over a portal in the church Forshem in Västergötland [Fig. 4.12.], and another on a baptizing font from Tingstad, in Östergötland.

The stone relief placed over the west entrance in Forshem church is, most likely, dated by the roof over the nave to the mid-twelfth century. The church pictured in the stone seem to be a small 'model' of a church building, which is placed at the feet of a stonemason at work (Svanberg 2011:30). Svanberg suggests that the pictured stonemason is a self-portrait



**Fig. 4.13.** View of the church and bell tower in the Skog tapestry. The church and tower are in the centre of the narrative. People, beasts and riders moves towards it from both right and left. Photo 2016.

and that the model-church communicates that the stonemason was a master builder (ibid). The pictured model-church shows the exterior. It is the north facade of a two-story structure with windows and doors, set in masonry walls. The church has a west-tower, nave, chancel and apse (ibid). Svanberg points out that the model could not be a representation of the one story twelfth century church in Forshem itself (ibid), and proposes that it is a “role model for a larger Romanesque church”<sup>16</sup> (ibid).

A similar relief in stone is collected in the Swedish History Museum in Stockholm. The picture of a church occurs on the foot of a stone baptizing font from Tingstad church, in Östergötland. The font is dated stylistically. Svanberg suggests that a stonemason Sigraf, whose teachers [Majestatis and Semi-Byzantios] worked in the late part of the twelfth century, made it (Svanberg 1995:204f). As in Forshem, it presents a north façade with windows and doors in masonry walls, including west-tower, nave, chancel and apse; however,

this church was not pictured in two stories, as in Forshem, only one (photo in Ullén 1995:49 [fig. 42]). Ullén interprets that the [visualized] roof with shingles and a decorated ridge in the Tingstad relief, was made of wood, and finds that the decorated wooden roof contrasts the unadorned masonry façade (Ullén 1995:49). Ullén points out that “many of the Romanesque stone churches are very simple and, for example, do not have articulated bases and portals” (ibid)<sup>17</sup>. Ullén argues that, “[t]he task to give the exterior a definitive and individual design was assigned to carpenters and wood carvers and concentrated to the various parts of the roof” (ibid)<sup>18</sup>. Unfortunately, no such wooden decorative out-door roof parts have survived, but Ullén finds evidence in representations, for example the reliquary from another of the five churches, Gamla Eriksberg (photo in Lindgren 1995:297 [fig. 355]), and the church in the tapestry from Skog in Hälsingland (ibid).

### **The woven church in the tapestry from Skog**

The tapestry from Skog is collected in the Swedish History Museum in Stockholm. It attracted attention in 1912 when art historian Erik Salvén found it in the local church in the village Skog, in Hälsingland<sup>19</sup> (Salvé 1923). The tapestry is 177 cm long and 38 cm wide (Franzén & Nockert 1992:31), however a part of it about 16 cm in the right side, is obviously missing (ibid:55). It was made with linen and wool (ibid:28), and samples of both materials were analysed with <sup>14</sup>C (Nockert & Possnert 2002). The results differ somewhat [linen 1245–1290 and wool 1275–1395] (ibid:76) however, Nockert argues that the tapestry was made in the second half of the thirteenth century (Franzén & Nockert 1992:59ff, 101–104; Nockert 1995:351). In 1912, the congregation in Skog used it to fold around their collective bridal crown, and they kept the package stored in a coffer in the church (Salvé 1923). However, in the medieval period, the tapestry was likely a wall hanging in a church (Franzén & Nockert 1992:31). Even if only few medieval tapestries have survived, Nockert argue that wall hangings were probably common in Scandinavia, and domestic production was widespread (Nockert 1995:337f). As pointed out in the previous sub-chapter [4.3] Franzén & Nockert finds it likely that most churches’ walls were covered with textiles [*tjeld*] (Franzén & Nockert 1992:91).

The many colourful figures and geometrical decorations were formed in dyed wool, which contrasts the bottom in white linen (Franzén & Nockert 1992:28). The weaver probably worked in front of an upright loom with a technique called ‘soumak’ (ibid:13). This means that the figures were not embroidered on to a previously made fabric. Instead, the weaver enmeshed, or ensnared the wool, in tandem with weaving the bottom (ibid). Thus, the weaver must form various patterns and figures across the whole width of each weft simultaneously (ibid:32). The weaving started from the right side of the tapestry (ibid), which suggests that the narrative should be interpreted from right to left. Lively ribbon-like borders with crossing lines and rhomboids frame the visual narrative.

The insights from the chapter about roofs [4.3] show that there are similarities between the soumak weaving and the carpentry making lattice trusses. Like yarn or other materials for

weaving, the timbers for struts form long thin lines. In addition, the carpenters constructed the lattice by adding the crossing struts gradually. Thus, as in textile craft, the forming of a lattice pattern grew from parts ‘added on’ as opposed to, for example, ‘carving out’ of something. Further, as in weaving, it was necessary to add the crossed [strut] lines in a certain order, one after the other. Even some of the joinery have similarity with textile craft, as the iron nails were bent on the backside to join two timbers. Carpenters ‘snared’ the intersection between two timbers into place. Thus, there were some similar principles, which guided both weaving a tapestry and making lattice trusses. The lattice form; crossed canted lines that form a lively grid of varying rhomboids, probably comes easy making something this way. The ribbon-like borders that frame the Skog tapestry, were for example, formed very similarly. Just as the lattice grid, the borders are a play with crossing lines and rhomboids.

The narrative in the Skog tapestry pictures a vivid ‘landscape’ with a church and bell tower in the middle. The two structures are obviously in the centre of attention. The setting recalls a place for worship. The church is humble; it has only a nave and a smaller and lower chancel. This is different from the two depicted churches in Forshem and Tingstad that have a west tower and a chancel with aps. A large number of colourful people, beasts and riders moves, seemingly with haste, towards the church and bell tower, from both right and left. The movements are probably from east and west, as the church has the chancel placed to the right of the nave (cf. Hoftun 2008:321ff). The dynamic narrative has been the object of academic interest, and most discussions are from a religious historical point of view. Franzén & Nockert finds that the narrative is entirely Christian (Franzén & Nockert 1992:61). Most interpretations collect around a religious battle between pagan/evil and Christian/good powers (e.g. Franzén & Nockert 1992:50–54; Hoftun 2008:321f; Horneij 1991:100ff; Salvén 1923:112). The weaver’s church is an inhabited interior, and this has opened for further interpretations. Nockert for example, interprets that people in the church take refuge, while the power of bells ringing chase the evil enemy away (Nockert 1995:346ff).

The weaver presented the church interior in a longitudinal section<sup>20</sup>. Eckhoff (1914–1916) interprets that the Skog tapestry church has “the front [south] wall removed so that one can see the inside”<sup>21</sup> (ibid:348f), however, he argues that the pictured roof is nevertheless an outside view (ibid). Salvén (1923) for the same, and explains that the weaver wanted to account for both the type of building, by showing the exterior view of the roof, and what goes on in the interior at the same time (ibid:57f).

The Skog church has been connected to research about standing or excavated early churches. Eckhoff finds that the pictured walls represents a wooden structure, and argues that it is a stave church (Eckhoff 1914–1916:348f). Salvén finds the same and argues that masonry walls would have been depicted thicker (Salvén 1923:66). The understanding that the Skog church depicts a wooden stave church has since been accepted (e.g. Franzén & Nockert 1992; Salvén 1923; Ullén 1995:49). The woven church has mainly been compared to two standing wooden stave churches, Haltdalen, Trøndelag, in Norway, and Hemse, Gotland, in Sweden (Hoftun 2008:332). Salvén finds that the top part of the pictured roof represents a ridge-decoration (Salvén 1923:61f), and that the roof covering represents wooden

shingles with pointed bottom ends (ibid:57ff). He compares to physical remains of shingles in Garde church, Gotland, and to the depicted shingles on the roof of the church on the Tingstad font, though he admits that those pictured shingles are too large in relation to the building (ibid:59f). However, Salvén explains that this, to enlarge details without regard to a realistic presentation, is typical of “primitive art” (ibid:59). Yet, Salvén mentions horizontal boards as a possible alternative for real early church buildings (ibid:60)<sup>22</sup>.

### **A landed Ark and a shrine for sacred objects**

In this part, I aim to explore the visualized architecture in the Skog tapestry church further. I ask how the weaver pictured walls, floor and roof, and situated this structure into the picture landscape. The central argument is that the visualized elements of architecture relates poetically to the narrative in the tapestry. I work from an examination of the tapestry that I carried out at the Swedish History Museum in Stockholm. The museum staff put the tapestry out flat on a large table and it was possible to observe closely and take photographs. The examination took place in a room with good light, and the investigation was performed during one day. The observations were guided by the questions above. The investigation was carried out in tandem with researcher Anneli Palmsköld, who in particular focused attention on the tapestry borders. At the same occasion, measuring specialist Jörgen Spetz scanned the tapestry, and the obtained point cloud provides possibilities for future research (Linscott & Palmsköld forthcoming). Important to the future study is that the scan can enlarge the smallest detail, which makes it possible to follow exactly how the threads were entwined.

Asking about medieval textile images of buildings I draw on Elizabeth Carson Pastan’s approach, as she examines the architecture in the late eleventh century Bayeux Embroidery (Carson Pastan 2014:183–209). In order to understand how medieval visual language works, Pastan pursues general strategies for representing architecture. She points out that a depicted building did not always have to resemble its prototype visually. It was enough to show some vital aspect, to identify a given building (ibid:188f). In addition, some medieval representations of buildings show impossible combinations of different views simultaneously. A building can for example be divided down its longitudinal axis and the sidewalls moved to the front plane (ibid). Pastan finds that the visual techniques emphasized what mattered, what their beholders thought were important elements, and thus, other features such as actual size, visual appearance, and spatial relation become irrelevant (ibid). Pastan argues that the buildings in the Bayeux Embroidery have an important role in the narrative. She asks for what choices that were made, which might reflect the values and point of view of the designer, for example, which places/ buildings were chosen to depict, and which of these were added significant details such as specific topography (ibid:185). Pastan finds that the search is for [visual] descriptions that combine a broad and abbreviated, conceptually driven presentation with, occasionally, specific details (ibid:193f). These approaches will be applied here, as I ask how the pictured church and place for worship is defined conceptually, and in addition, what specific details occur?



The longitudinal section presents the nave and chancel. The weaver formed the walls with a distinct solid thick line, which is a little more than 1 cm wide, and made in red wool. The left, [west] wall-line is in addition marked with two thin vertical yellow lines, within the solid red. The gables slope up and out, and they are decorated. The floor, which seem to have boards, was pictured in almost the same manner, with an equally thick, solid line in wool. However, the individual boards in the floor are marked with different colours, as if they were cut through in the section. The boards fit tightly together, and the floor-line stretches, uninterrupted and at the same level, from right to left, from the chancel's east wall to the nave's west wall.

The weaver pictured the roof over the nave quite differently. The roof part was instead defined with three thin, separate horizontal lines in red respectively yellow wool. In between these lines a number of even thinner, diagonal crossing lines about 5 mm apart, in blue wool, form rhomboids. This leaves much of the bottom fabric of white linen visible. Two similar thin horizontal lines define the small roof over the chancel. Between these two is, instead of crossing lines, a chessboard pattern, which the weaver formed with blue wool against the white linen bottom. To the right [east] is a different roof-pattern, perhaps with a symbolic figure, which stand out. The weaver placed a small bell-tower on top of the nave's roof, and pictured the coarse horizontal beam that hold the bell in the same way as the floor. The rope from the bell was made with red wool. The thin curved line hangs down, visible all the way through the roof and woven in front of the blue yarn lattice, and continues down to the nave room.

The weaver pictured five individuals next to each other in the nave. They fill the whole room completely, that is, they reach from the floor to the roof, and from the right [east] to the left [west] wall. Their arms are raised, as if they hold hands, while walking in a line (cf. Hoftun 2008:333). Two persons hold or pull the roof-bell's rope to ring. Three carry a long thin item like a rod (cf. Franzén & Nockert 1992:52). Four people, of about the same size and shape as those inside the nave, are gathered in a similar long line just outside the nave's west wall. The people outside are standing on the 'ground', which is represented by a long thin contour at the top of the bottom border. Three of these individuals carry a long thin item in their right hands, just as those in the nave. Hoftun assumes that there is an entrance door in the west wall (Hoftun 2008:331). However, this opening is not obviously visible in the picture. Yet, perhaps the two yellow lines in the west wall represents a doorway. Nevertheless, it looks as if the line of people inside and outside were involved in the same, collective social activities. There are also people gathering to the right [east] of the church, between the chancel and the bell tower.

The weaver placed a priest in the small chancel next to the main altar. The priest is smaller; however, he too fills the space, as he reaches from the floor to the roof of the tiny chancel. He has a long item in his right hand, and he puts his left hand on a square, chessboard-patterned object on the altar. This, likely holy 'thing' has been suggested represent a book, a reliquary or perhaps a chalice and pâté under a cloth (Franzén & Nockert 1992:53f). The activities in the nave and chancel seems noticeably social, like a ceremony. Hoftun interprets that this

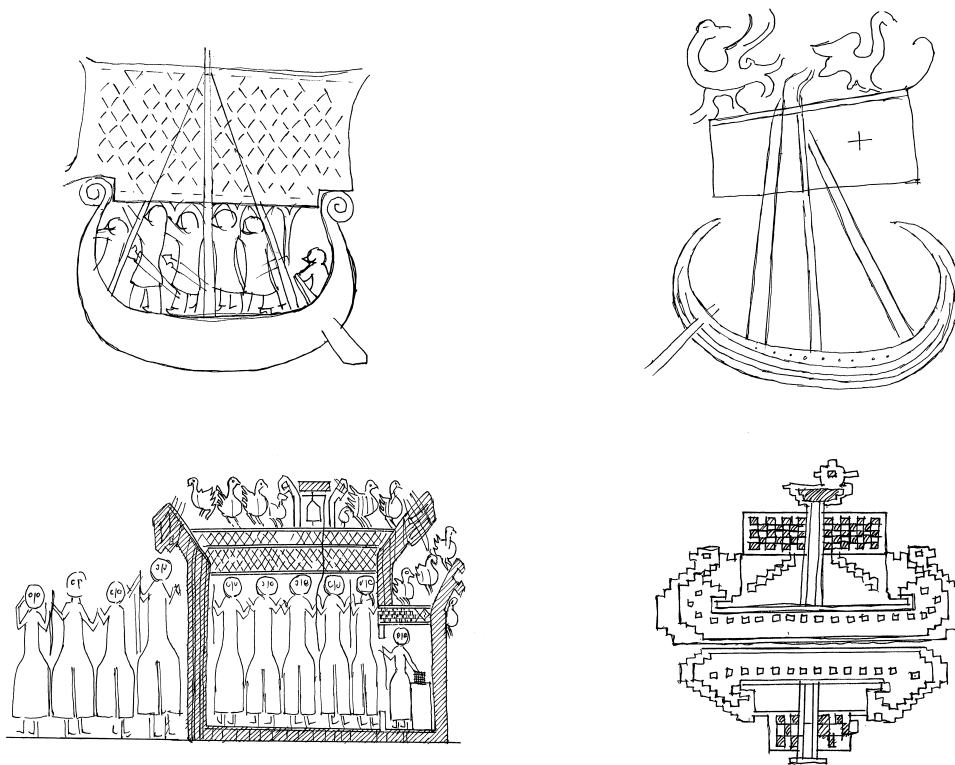
is the church' consecration (Hoftun 2008:310, 321, 334). The weaver made seven colourful birds in wool, which were lined up next to each other on top of the nave's ridge. Three other birds occur over the chancel ridge and another three, over the bell tower. The birds are similarly shaped, but of different sizes and colours. Their liveliness stands out.

The woven walls, floor and roof merely implies the presence of a church, rather than a realistic building. The church picture is in fact very small, only about 20x20 cm, almost like a miniature. Yet, the longitudinal section makes the rooms seem large in spite of the smallness. This suggests a larger scale, it opens up, and it is a welcoming space. The small size makes it both intimate and conceptual. The observer can imagine being inside and at the same time see it from a distance. Seen as a shape, the heavy wall-floor contour line forms a section through a container without a top. The outwardly sloping and decorated gables turns this image into an elegant 'jar' with flared brim. The roof over the nave is, contrasting the solid walls and floor, designed in a light, almost see through manner. Its lattice pattern is similar to the crossing lines and many variations of rhomboids in the tapestry's borders. Because this pictures a roof, real, standing lattice trusses with crossing struts come to mind as well. In fact, it seems possible that this is indeed not an outside view of a roof covering with shingles as suggested by Salvén and Ekhoﬀ, but instead an inside view.

The solid wall-floor line forms a safe container, which both protects and welcomes. At the same time, the light roof above appears more open, it reaches out and is open to the sky. The chosen design concept 'solid container with flared brim and latticed, textile-like top' could be connected to another figure of thought, which is often used as a metaphor for a church; an ark or a ship.

Trying the idea 'ship', there are in fact a number of both older and contemporary pictures to examine. Shifting the focus slightly to textiles, there may be a connection between the lattice-formed trusses and early sails. Courteney & Alcock suggest that the church builders in Sweden may have created lattice trusses "echoing the lattice-covered sails that make up a distinctive and prominent component of the Gotland picture stones" (Courteney & Alcock 2015:150 [note 42]). The correspondence between the lattice trusses and some of the pictured boats with lattice-sails in the Gotland stones (Nylén & Lamm 2003)<sup>23</sup> is striking. The pictured boats with sails fit the design description well. The hull was pictured from the side forming a container with curved, decorated front and back. The boats have masts with a large sail, framed by horizontal lines. The sail has crossing diagonal lines forming rhomboids, like a lattice. There is a crew on board, and the persons are placed next to each other in a line, often filling the space between the hull below and the sail above. A helmsman in one end of the ship holds on to the rudder. The crew has shields and sometimes weapons, like rods.

Images of ships with sails also occur in early medieval textiles. One example is the blanket from the church in Kyrkås<sup>24</sup> in the region Jämtland in Sweden (Franzén & Nockert 1992:68 [fig. 68]), dated with <sup>14</sup>C to the interval 800–1250. The Kyrkås blanket is about 90x90 cm, and it is covered with a pattern with crossing broad diagonal lines, rhomboids. The octagonal intersections includes figures, for example birds, animals or geometrical designs. One is a ship, which, similar to the Gotland picture stones, was pictured from the side. The boat has



**Fig. 4.14.** **Left above**, sketch of example of a ship pictured on a stone, this one from Ardre, Gotland, dated to Viking Age. Collected in the Swedish History Museum SHM 1118:VIII [108199]. **Right above**, sketch of ship pictured on a stone with runes from Sparlösa 26, Västergötland [Vg 119], dated to ninth-eleventh century. **Left below**, sketch of the church, pictured in the tapestry from Skog, dated to the thirteenth century. Collected in the Swedish History Museum [15275]. **Right below**, sketch of a ship pictured in the woven blanket from Kyrkås, Jämtland, dated to 800–1250. Collected in Jämtlands läns museum [SHM 145830]25.

The pictured boats with sails fit the design description for the church in Skog. The hull was pictured from the side forming a container with curved front and back. The boats have a large sail, one with crossing diagonal lines, one with chessboard pattern and one with a cross. There is a crew and a helmsman in the ship from Gotland. The people are placed next to each other in a line, filling the space between the hull below and the sail above. The helmsman is in one end of the ship, and he holds on to the rudder. The crew has weapons. There is no visible crew, in the Kyrkås ship two however, a line of dots along the side of the boat perhaps hints to this. In the Sparlösa ship there is a rudder. On top of the mast and sail, in Kyrkås and Sparlösa, is the picture of one or two birds. The three ships looks like they are out at sea, in Kyrkås as its mirror image was pictured in water below.

The contour of the Skog church, viewed as a container without a top, shaped by the thick wool line for ‘walls’ and ‘floor’. The thin crossing lines above, forms the see through, open lattice roof. There is a congregation [crew] and a priest [helmsman]. The people are placed next to each other in a line, filling the space between the floor [hull] below and the roof [sail] above. The priest is in one end of the church, and he holds on to something on the altar [the rudder]. The congregation hold on to things.

curved, decorated front and back. Over this is a square sail with a chessboard pattern. The mast was placed in the middle of the ship. There is no visible crew or helmsman, but perhaps a hint of them or their shields, formed by a line of dots along the side of the boat. On top of the mast and sail is a picture of a bird, shown in profile. The ship looks like it is out at sea, as its mirror image is pictured in the water below. There are similarly shaped boats with sails depicted in the relatively nearby tapestries from Överhogdal, in Härjedalen. A sail with two large rhomboids occur in the Överhogdal tapestry Ia (ibid:41 [fig. 37]), and a sail with crossing lines in the Överhogdal tapestry III (ibid:49 [fig. 48]).

Andersen & Bischoff find that there are many pictures of sails, which occur on coins and stones, and that these present various types, both with panels, diagonal crossing lines and square patterns (Andersen & Bischoff 2016:123). No early sails are preserved, and the pictured sails with squares and crossing diagonal lines do not relate easily to later preserved sails. Andersen & Bischoff find that it is not possible to say if the lines had a practical function or if they were merely decoration (ibid:127). However, Andersson finds that the production of sail, in wool or textile materials, was complex (Andersson 2016:21ff). Working from experiments and calculations based on Viking Age texts, she finds that it would have taken several years for a single craftsperson, and wool from many sheep, to produce a large sail (ibid). Thus, a large sail was valuable, perhaps more so than the boat? The costly sails were likely worthy as a theme in the churches.

The congregation in the Skog church/ark/ship does probably not carry weapons, and the weaver did not picture them sailing out on a troubled sea. On the contrary, the tapestry church/ark/ship has landed in a specific place; it is powerfully beached in the middle of the narrative on the tapestry ground-line in wool. Thus, there is a physical, woven, relation between inside the church and outside in the narrative's topography. By borrowing from boat imagery, the weaver did not invent a new shape, but relied on a visual similarity with boat forms. This reference may draw on both earlier pre-Christian images of ships with sails, as well as Christian iconography of the church seen as a vessel or ark.

Going inside, the woven interior is a small windowless church, like a chapel. However, it does not seem to be dark there, and it is not locked in, as in a shell. This is because the picture show a longitudinal section which makes the room seem large, and that the roof is shaped very lightly. It is as if the room was illuminated from above. A viewer's focus of attention is directed vertically. In addition, the picture underlines social activity, it communicates that we are welcome on board, to come inside. The church is open both to the sky and to the world around. The whole design is similar to the poetic image of a 'nest', described by Bachelard, who argues that being starts with well-being,

The nest /.../ knows nothing of the hostility of the world. /.../ life starts with refreshing sleep. Eggs in a nest are kept nicely warm. The experience of the hostility of the world- and consequently, our dreams of defence and aggressiveness- come much later (Bachelard 1994:103f).

The weaver only included two objects in the interior, the freestanding altar in the chancel and the argued holy 'thing' on top of it. There is no side altar e.g. for Maria or a baptizing font. The object on the altar is in the centre of attention. The weaver points to it and yet,

[perhaps] keeps it hidden under a small cloth. It is probably of importance that the priest puts his one hand on the thing. This strengthens the argument that the thing was imagined as charged with sacred power and could not be considered mere decoration. The priest is perhaps in the act of blessing, if it is bread and wine. It could be the other way around, if the thing is for example a relic. Then the earthly human priest would absorb, by the physical contact, some of the holy power. There seem to be a play with spirit and matter. One way or the other the pictured situation suggests that holy matter was part of the weaver's imagination. The priest/helmsman was guided by sacred stuff, perhaps using the hidden thing on the altar as a rudder.

The Skog tapestry was originally hanging [on a wall or as an antependium in front of an altar], and likely belonged to a church (Franzén & Nockert 1992:31). Thus, this woven picture of a church interior was itself, part of a church interior. There was a mirror-relation between the physical tapestry picture and the room and situation it was placed in. If the lively picture was put up on, in front of an altar, it would have strengthened and explained the presence of the holy relic hidden just behind.

I hope to have shown that the visualized church architecture does not only represent common real stave churches and building practices. The tiny little woven church communicates an intense image of an intimate place for worship. The woven image combines the idea of a realistic church with a fantasy ark and holy shrine. It is at once specific and generalized. Thus, the visualized elements of architecture relates poetically to the narrative. However, the questions about how, cannot be clearly answered. An observer cannot know precisely what happens, and the weaver cannot tell. Various parallel understandings have existed and changed over time, and will continue to alter.

#### **4.5. BETWEEN THE ACTS<sup>27</sup>: THE END OF THE TIEBEAM GAME**

Before long people changed their activities and ceremonial practices, and thus the setting. This last part seeks to examine 'the end of the tiebeam game'. I propose that this sequential approach, with questions about what happened next, may put the mid-twelfth century situation in relief. What did people think was missing? What did they change? A guiding question is how the altered architecture is different from the previous. To examine I sketch traits of changes focusing on 1) the entrance situation, 2) the nave-room's character, directions and zones. It is in some cases, but far from always, possible to give a chronological account of the events based on scientific dating. To cope I seek to untangle the events within the two themes separately. To limit the scope, the main object of investigation is the church in Gökhem, though Forsby, Forshem and Marka are brought in to support the interpretations.

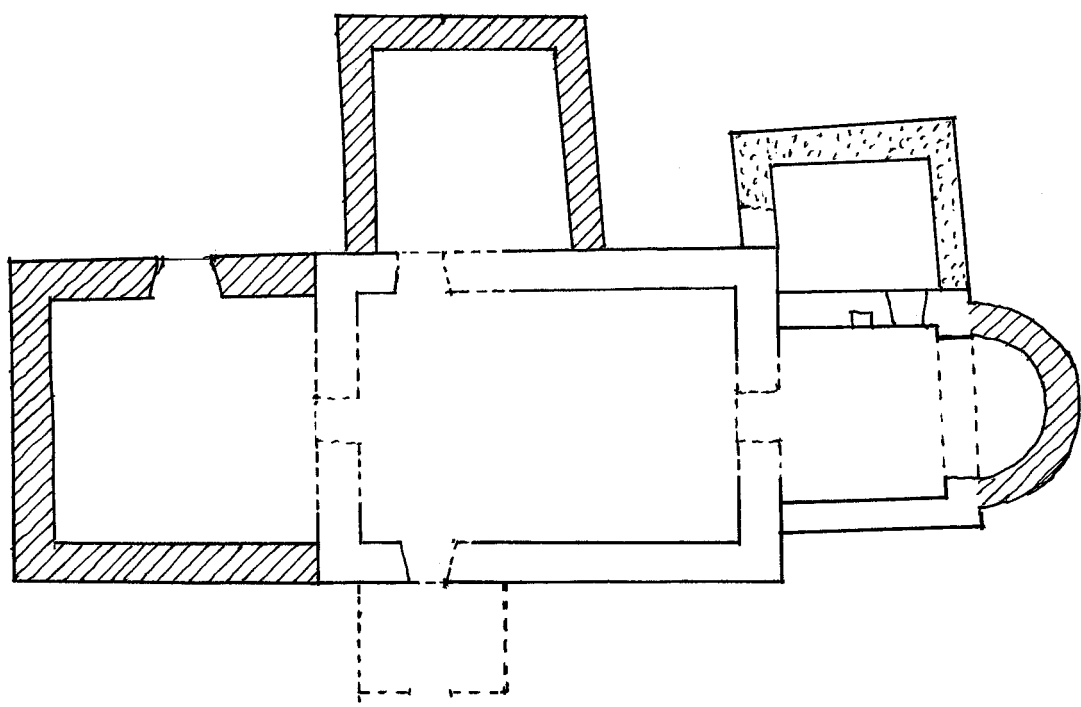
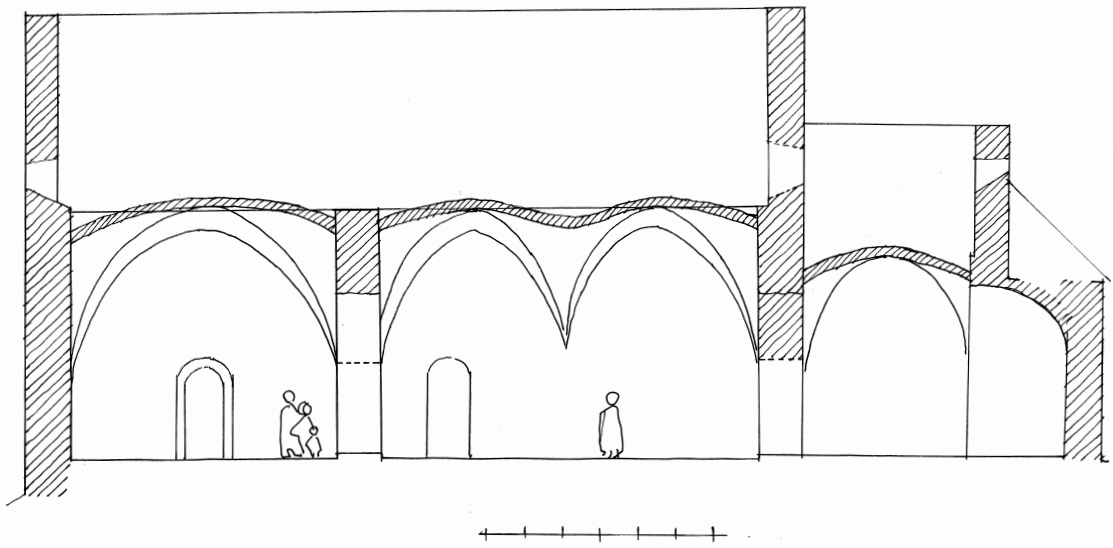
##### **Adding a porch to the porch**

A new structure, with the same height and width as the old nave, was added towards west in Gökhem. Today there is a large, arched opening in the original nave's west wall. The arch

was shaped before the vaults were painted, as these were adapted to it. Hernfjäll finds that the vaults were painted in 1487 (Hernfjäll 2011:16), however, she suggests that the added west structure is probably older than that (ibid:13). The added structure's original roof is most likely, partly preserved (cf. Gullbrandsson 2015:93). Wall plates, two on each wall, and parts of six out of eleven trusses remain (ibid). The timbers are prepared in a medieval manner, they have sharp edges and the joinery is similar to other early roofs. Yet, this was not a common-tiebeam roof construction and the trusses probably had collars (ibid). The timber has not been sampled, and is not dated with dendrochronology however, the remains have much in common with the roof over the chancel in Gökhem, which is dated with dendrochronology to the 1230s [after 1229] (Seim et al 2015:47). The west roof, and thereby the room below, may belong to the same mid-thirteenth century period. There is an original window in the west gable in Gökhem, and based on this and the truss-type, I interpret that the trusses were likely visible in the room below.

People wanted to be able to enter the new west room directly from the outside. They provided it with an entrance in the north wall, and installed the heavy ironclad wooden door with stone portal [which is now the main entrance in the north chapel] (ATA Gökhem). The new room covers the 'place' in front of the west wall entirely. A similar west room was added to the nave in Forsby, and as I interpreted earlier [chapter 2], this probably coincided with that the older nave was elevated. The roof over the west addition in Forsby has common-tiebeam trusses with two crossing struts and a collar. The roof is almost completely preserved. Gullbrandsson suggests that it was built not later than the mid-fourteenth century (Gullbrandsson 2015:59). However, it could not be dated with dendrochronology, as the samples were not possible to match with the mean curve (Seim et al 2015:47). As in Gökhem, the west addition in Forsby covered most of the 'place' in front of the west wall, the top of the old burial mound. The people in Forsby, as in Gökhem, wanted to access the new west room directly from the outside, and they provided it with an entrance in its south wall. As pointed out in chapter two, traces from this [original but later closed] doorway with rounded top, was observed by Beerståhl during the restoration in 1979. The original south entrance to the nave and the new south entrance in the addition were likely in use simultaneously for centuries. The two doors were depicted next to each other, for example in a painting from the 1740s in the naves' ceiling [Risberg], and in a drawing from the 1860s [Brusewitz] (ATA).

In Gökhem, the original north entrance to the nave, and the new north entrance in the addition probably also existed next to each other, about five meters apart, until later in the medieval period when a chapel was added on. The entrance in the new west-room was in place until 1775, when it was replaced with a window, and the ironclad door and portal was moved to the north chapel (ATA Gökhem). The original south entrance to the nave was sometime later, unclear when, also covered with a porch. In the late eighteenth century, the priest Lindblad calls this 'the south porch' [*södra vapenhuset*] (ibid). It was built in wood and still in place in 1839, however taken down, and the doorway walled up, before the 1890s (Hernfjäll 2011:35 [note 2]). There is only written evidence. Because of the sloping hill, it was likely relatively small.



**Fig. 4.15.** Above, longitudinal section and below, plan layout with west, north and south additions in Gökhem.

The new structures in front of all the original direct entrances changed how people entered the naves. The entrance situation and west-zone with its interpreted openness and light, and connection to the place and view outside, was gone. Hernfjäll comments that the new north entrance in the west addition in Gökhem was “without a porch” [*utan vapenhus*] (Hernfjäll 2011:13). I argue that this was, simply, because the addition was itself a porch. It provided suitable shelter for people participating in ceremonies, which had earlier been performed outdoors. They would still be performed in the very same spot as before, though not under the sky and not with the same view. This would explain why there were two doors to the nave placed next to each other in the subsequent situations, both in Gökhem [towards north] and in Forsby [towards south]. It is not impossible that the door and portal in the new [north] entrance in Gökhem was the original from the west wall. If so, door and portal was only moved a few meters.

As discussed previously, a doorway is a powerful architectural tool. The twelfth century concept for a suitable entry, a play with contrast and light, a direct entrance to the room in an open setting, and a view-point outside was changed. I argue that the interpretation, that a porch was added to the porch, means that the basic idea of the original nave being itself a porch to the chancel, was no longer in play. There was now a porch to the porch-nave-room. Yet another passage between the outside and the Holy relics. The new porch was a new setting for a different kind of entry-experience. Moving takes time. When two entrances interrupted the movement, the being in between, the transitional state of being (cf. Unwin 2007:198) was substantially prolonged. The changes meant that people encountered the entrance situation differently. It was now a series of stages from the open to the closed. It started from the north side, not the west, and there was no viewpoint from under the open skies. People stepped over the first threshold and passed through a door to the west extension. From there they entered the nave, completing the experience of refuge or identity. If the door to the new porch was the same that used to lead to the nave directly, moved and reused, this must have made the experience even more complex.

### **From nest to shell**

This part first concerns the churches in Gökhem and Forshem in the 1230s–1260s, more or less a century after they were raised. Thereafter, I will shortly touch on changes that were carried out during the late medieval period. More or less in this same period, a number of famous northwest European Cathedrals were constructed in elaborate Gothic styles, for example in Chartres, or Sainte-Chapelle in Paris. By the end of this period, the scholar and bishop William Durand [c. 1230–1296], wrote his famous ‘Rationale for the divine offices’ [*Rationale divinatorum officiorum*], which included ideas about the church building and its liturgical art, for example light. Some Scandinavian clerics had opportunity to learn and admire the architecture, as they went to Paris to study. Brynolf Augustsson for example, who had been in Paris for a number of years, became the bishop in Skara in 1278 (Rosborn & Schimanski 1995:46). In Swedish towns, monks joined an increasing number of





**Fig. 4.16.** Above, Gökhem east gable top in the chancel with openings. **Above left**, from outside and **right** from the inside. Photo 2014.

**Fig 4.17.** Below, Forshem **left**, east gables from the outside. **Middle**, east gable top in the chancel with opening. **Right**, east gable top in the nave with a subsequent opening. Photo 2014.

new Dominican Monasteries. Examples are Visby, Söderköping, Sigtuna and Skänninge [in the 1230s], Skara [in 1242], followed by Uppsala and Åbo in Finland [in the late 1240s] (ibid:39ff).

The people in Gökhem re-built, elevated, the chancel in the mid-thirteenth century. This happened, according to the dated roof, in the 1230s [after 1229] (Seim et al 2015:47). They made the chancel-room higher. The apse may also have been remade or, it was new. The roof is only partly preserved; mainly the coggled wall plates of oak remain. The builders placed two on top of each wall. The outer two plates were stuck into holes, which they made in the old east nave wall from the outside. The plates' surfaces were carefully prepared. Notches in the wall plates reveal that the structure had seven trusses. An imprint in the east gable sketches the general shape. The only surviving piece of a truss, a bottom part, shows that the joinery was similar to other early roofs.

The preserved east masonry gable has an imprint of the most eastern truss in the stones and mortar. This shows that it was not a common-tiebeam roof construction; the small room had open trusses with collars. Further, the roof [dated 1230s] was in place when the masons raised the gable. There are three original small window-openings in the gable, which were placed just outside the contour of the apse-roof. Thus, I interpret that the chancel-room below was still open to the roof above in the 1230s, lit with beams of light, like three spotlights, from high above. Further, the apse with roof was probably planned for when the masons made the gable. Today the chancel has a stone vault, which was clearly raised after the roof however, exactly when is not possible to say.

Two or three decades later, probably in the 1260s [after 1256] (Seim et al 2015:47), people in Forshem decided to build a completely new chancel, and they too, wanted the chancel-room to be higher than before. Both roof and masonry are preserved, almost complete. The roof was made of a mix of oak, pine and spruce. They placed two wall plates [of oak] on top of each wall. The structure has nine trusses. The two outer, by the gables, have tiebeams and two canted struts, however, the seven in between have a collar instead of a tiebeam. The joinery is similar to other early roofs. This is both a common-tiebeam roof construction and not. As in Gökhem, I interpret, the chancel has a subsequent stone vault. In the east gable of the new chancel, they made one small opening, a window with a cruciform shape, which is still open. Just below this, i.e. under the vault, is a triple lancet east window in the chancel-room. Both these windows have a Jacob's ladder at the bottom. I interpret that this roof, as in the chancel in Gökhem, was open to the room in the 1260s. The opening high up in the gable, cast like a spotlight, from high above into the room.

The new higher chancel in Forshem church had consequences for its nave, as the original opening in the nave's east gable was covered. Therefore, masons re-built the top of this gable, and created a new smaller opening at the very top. This opening is narrow and similar to the one in the chancel, though it is only straight, not cruciform. Thus, I interpret that the roof over the nave in Forshem was still open to the room when the chancel was built new in the 1260s. The opening high up in the gable, suggest that the nave-room below was lit with a beam, like a spotlight, from high above.



**Fig. 4.18.** Medieval wooden figures from Gökhem, now disappeared. Photo 1924, ATA.



**Fig. 4.19.** Tiebeams and vaults in Forshem. Photo Eriksson 2011.

It seems that the rooms were still open to the roofs, in both the chancels and at least in the nave in Forshem, after these re-buildings in the mid-thirteenth century. The carpenters who made new roofs over the chancels in Gökhem and Forshem had a different idea of what to make. It was no longer about many tiebeams and crossing struts. They used collars instead of tiebeams. Thus, the new and higher rooms, nave and chancels, were opened even more upwards. This theme, ‘upwards’, was probably underlined with the concept ‘ladders’ in the windows in the chancel in Forshem. The light from the sky was cast down from high above, not from large openings, but from narrow openings like spotlights.

Sometime between the late thirteenth century and the late medieval period, people in Gökhem remodelled the nave. They put up a ceiling of boards, which they nailed to the bottom of the tiebeams. These boards were taken down again when they constructed the stone vaults before the 1480s. Thus, the traces from the ceiling are few and fragile. They are hard to find in the dark. There are a few nails remaining in the bottom of the tiebeams, and many holes from the removed nails in straight rows. There are traces from the boards, in the form of very old dust [before 1480s], which had collected between them.

A consequence was that the nave-room became lower. It became a completely different volume. The direction would be less upwards and more forward, towards the altar. There would no longer be light from the windows up high on the south wall, or in Forshem, beams of light from the small openings in the east gables. Another result was that the tiebeam roof was relegated to a dark attic. From this time, the trusses were no longer visible or valued as important architecture; they were merely practical roof carriers. With it, in Gökhem, went for example the black line and the lightning. Perhaps, it was at this occasion the psychological barrier in the ‘middle’ in the nave was erased, and the congregation and many sacred figures got access to the whole nave? Perhaps it is now that Maria moves comfortably in, settling on the northeast corner altar? The ‘Marias’ that have survived Västergötland seem to support this idea. About a hundred medieval, wooden, Maria sculptures are preserved (Rahn 2002:7). Counting in Rahn’s catalogue, most of these are dated stylistically, to the thirteenth [48], fourteenth [8] and fifteenth [33] centuries (ibid). Only few are dated to an earlier period [8] (ibid). There was an altar in the northeast corner in Gökhem later in the medieval period, as the priest Lindblad writes [in the 1780s] that there used to be an altar in the northeast corner of the nave (ATA Gökhem). This was dedicated to Maria and there was a Madonna placed on it. This was called the “women’s altar” [*kvinno-altaret*] (ibid), and he explains that women used to sacrifice to the priest there, “one large cheese and big, thick and nice cakes” [*en stor eller halvpunds ost jämte stora, tjocka och fina kakor*] after childbirth (ibid). He claims the practice was abolished in 1720, and the altar was moved to the north chapel, “the monks’ chapel” [which is the porch where the main entrance is today] (ibid).

The priest Lindblad continues that there used to be a screen, wooden “boards or gallery” [*plank eller galleri*] in the opening between the nave and the chancel. On this screen, “pontifical pictures” [*påfviska bilder*] were fastened (ibid). He writes that the screen was removed “more than 60 years ago”, i.e. in the beginning of the eighteenth century. Yet, perhaps some of these were indeed kept. They may be the wooden figures that wave to us on a

photograph from 1924 (ibid). If so, they survived both to be removed in eighteenth century and the restoration project in 1913, when medieval wooden sculptures were sold for firewood (Hernfjäll 2011:14, 16).

Finally, when vaults were erected the tiebeam trusses were no longer just hidden, they came into conflict. The vaults needed space and the tiebeams were cut off if necessary. This was carried out without mercy. Their old meaning was completely forgotten.

## Notes chapter four

- 1 Topology is a topographic study of a particular place (Merriam-Webster Dictionary). Further, a network topology may include nodes and connecting lines.
- 2 My translation from Swedish, “hemvister där göken höres”.
- 3 Nave and chancel measure 16x7.5 m [E-W]. Walls of limestone 1 m thick.
- 4 At this time, the national Church of Sweden’s authorised faith was no longer Catholic, but Lutheran.
- 5 Exactly how long the surveyor’s yards were in relation to meters is not safe to say without further investigation.
- 6 Nilsson writes in “the porch” [vapenhuset]. However, even if all churches probably had porches later in the medieval period, there may or may not have been a porch in front of a church-door in Gökhem in the mid-twelfth century.
- 7 However, wedding ceremonies were performed in front of the church-door during the late medieval period. This was followed by a ceremony inside the church, which was not a wedding but a confirmation, in the form of a Mass [brudmässa] (Nilsson 2004:136f).
- 8 True north is the direction along the earth’s surface towards the geographic North Pole. True geodetic north differs from magnetic north and from grid north (e.g. Wikipedia).
- 9 I thank Jan Michael Stornes and Ola Storsletten for bringing this reference to my attention.
- 10 My interpretation from Norwegian, “Borgundkirkens interiør er strengt og saklig i sin utforming, og det kan ikke være tvil om at selve kirken er romansk. [Utformingarna av svalgangerne er] forskjellige fra dem som karakteriserte den romanske stavkirken“.
- 11 The gallery in Hopperstad was recreated in the 1880s with the gallery in Borgund as a role model.
- 12 My translation from Norwegian, “gammel /.../ stavbygning med svaler rundt om /.../”.
- 13 Type 1 = door with a straight top.
- 14 Type 2 = door with a rounded door top.
- 15 The west wing of the present church in Flesberg was the original nave. This is dated to 1154–70 (Thun et al. 2016:100). The west entrance to the nave in Flesberg is still in its’ original place in the west wall (Anker 2005:182). The decorations carved into the portal planks belongs to a large regional group, the Sogn-Valdres portals [Type 1] (Anker 2005:182). The carving is similar to the portal in Nore stave church, indeed perhaps the same master carved them both (ibid:192). Dendrochronological analyses supports the stylistic dating of the portal (ibid). The portal was cut off at the bottom. The present door is wider and lower than the original door opening, and thus part of the carved planks on the sides moved apart to make it fit. A subsequent, added on porch (1735) protects the portal, the ceiling hides the view of the portals top. The paint is not original (ibid:182). Originally, the nave had a high middle room. The original nave was smaller; about the same proportions as Borgund (ibid:180). A painting in the church shows the building in 1701, and then, it had a gallery and a porch in front of the west entrance. Over all the church looked much like Borgund today (ibid:182).
- 16 My translation from Swedish: ”typbild för en större Romansk kyrka”.
- 17 My translation from Swedish: “många av de romanska stenkyrkorna är mycket enkla och saknar till exempel artikulerade sockelpartier och portalomfattningar.”
- 18 My translation from Swedish: ”Uppgiften att ge exteriören dess slutgiltiga och individuella gestaltning föll på timmermännen och träsnidarna och koncentrerades till takens olika delar.”
- 19 Skog is located by the river Ljusnan, and in the Early medieval period, this was a stretch on the pilgrim route to the Cathedral in Nidaros, or Trondheim, in Norway.
- 20 This is similar to only a few other the smaller images of churches that occur in the four tapestries from Överhogdal, in Härjedalen, Sweden. These are dated to the eleventh- or twelfth centuries [1040-1170] (Franzén & Nockert 1992:101–104).

- 21 My translation from Swedish: "...med den främre väggen avlägsnad, så att man ser det inre".
- 22 Traces of a different kind of roof covering with horizontal boards, previous to wooden shingles, have later been analysed and dated to twelfth century in three churches in Jämtland (Olofsson & Holm 2013:22).
- 23 Pictures at, <https://kulturbilder.wordpress.com/2013/07/15/bildstenar-bilder/>
- 24 The village Kyrkås had a small wooden church in the twelfth century (Olofsson & Holm 2013:25).
- 25 Pictures at, <http://mis.historiska.se/mis/sok/fid.asp?fid=145830>
- 26 Pictures at, <https://sv.wikipedia.org/wiki/Sparlösastenen>
- 27 I have borrowed this heading from Virginia Woolf (2011 [1941]).





## Discussion: Homage to ambiguity

By developing in-depth analysis in a case related to mid-twelfth century church architectures, the thesis has explored well-preserved buildings, and connected sites, buildings and people. I have worked from the insight that buildings and objects hold results of performed activities, and as a study system, the idea of ‘iterated, performed, articulations’ guided the work throughout.

The case gather materials from five churches in the same region, Västergötland. I have moved around, observed and touched the constructed physical materials, and measured and made analytical drawings. The change of scale gave me perspective and robust work materials. Being there, I could also take in a ‘poetic tone’, for example the choice of articulations, feel the billowing rhythm, or find possible themes. This, work, measuring and drawing the buildings, forms a large part of the empirical material. The point cloud from the 3D laser scan provided instrumental data for one church, Gökhem. It was in particular the multitude of data, for example the possibility to view the shape of each truss in the roof, from all sides, which contributed most. Instead of basing the analysis on drawings or photos of one, or two ‘typical’ trusses, I could work from [16] visualized, varying individual trusses. This provided a more robust base for different analyses, and moved the research. In two sub-chapters, the thesis connect to different materials from other regions in Norway and north Sweden however, dated with dendrochronology and  $^{14}\text{C}$ , to essentially the same period.

I have analysed the archaeological remains with architectural perspectives. Notably, the remains are part of buildings that were subjects to extensive restoration in the twentieth century. This is important to the archaeological search because it is not always obvious if a part is the original or not. The analysis and interpretations were made from combinations of the created empirical materials, my professional experiences and the writing process. There was overall, as I see it, a match between the nature of the problem, the systematic approach,

the gathering of data, and the created empirical materials. However, archaeological architectures are not obvious. Physical remains are mute, traces are vague and ambiguous, and the notion 'architecture' is wide-ranging. To cope, the search was delimited. First, I worked from analysis of 'basic' elements of architecture [walls, openings and roofs], combined with 'modifying' elements, which come into play once a building is in place [e.g. light and sound]. Thereafter, I analysed temporal aspects of architecture in a sequence of themes; 1) discovery and approach, 2) portal and doorway, 3) entry and exploration, 4) recalled in visual memory, and finally, change.

Both basic- and modifying elements of architecture are physical; they exist and can be observed and measured, though in different ways. However, together they form relationships. They create relative, specific situations that change, for example with the sun shining in from a window differently through the course of a day. Hence, the thesis' search was for non-permanent relationships between archaeological materials that exist [complete or only in part] and other elements [mainly light], that existed in the past. Further, individuals certainly moved and took different positions at the sites or in the rooms at different times, and each position is important for the relationships between the elements, and gives a different version to interpret. Moreover, different individuals were not alike, and it is hard to imagine people who lived in such a distant past that they could not possibly have imagined you. There are a number of possibilities and the results can only be approximate interpretations. Working with the thesis has been a continuing tension between archaeological detailed rigor handling ambiguous traces, and the analysis of interpreted architectural relationships.

Thus the goal was relatively open, getting there was in steps, and the path not straight. The thesis provide observations and interpretations, and the exploration reveals iterated patterns and variations in the buildings' archaeology and architecture. Here I discuss the results presented in the chapters 2, 3, and 4 as follows.

## **Chapter 2, Walls: shaping a firm box**

The chapter examined the original walls and openings in five naves. The question asked was, what walled structures the mid-twelfth century roofs covered when they were first put in place. I worked from investigations in the attics and from understandings and notes gathered by others during previous restoration projects. One church, Forsby was in the focus as an example and thereafter different masonry parts in the five naves were examined thematically [walls, gable tops, doors, windows]. People created the naves rectangular and box-like with solid, thick walls made of stones and mortar. The rectangular boxes were placed [more or less] in conjunction with the four capital winds. Thus, they connect to the idea of four horizontal directions in the world. Further, the parallel and longer north and south walls create a sense of main direction, a west-east dynamic in the room. The widths of the rooms [between 5.1 m and 6.5 m], i.e. the distance the roof covered over, are not far from the widths in remains of wooden naves from the twelfth century for example in the parts from the stave churches

Vänga and Hällestad, and excavated remains from both churches and long farmhouses in the region.

Masonry was not a common way to build in this region earlier, before the twelfth century. This means that people locally, in the same region Västergötland, in a relatively short period put up a large number of church buildings with a different type of construction, masonry walls. Vernacular building practices were, as revealed in excavated remains, still wooden, probably timber frames, during the twelfth century. It is likely that very few buildings, other than churches, were raised with masonry. The solid masonry walls both carried load from the roofs and protected the inside from the world outside simultaneously. This is a different concept from timber frames, which have standing posts to carry the roof and horizontal plates to keep the structure together, while various materials, for example wooden boards or wattle and daub, was put in between to protect from weather. The masonry walls were different also because they were made working from the ground and up. They were not raised up, as the posts in timber frames. Thus, the concept 'scaffolding' may have been new to the builders too. However, one thing connects the twelfth century masonry walls to timber-framed structures. This is the top part of the masonry walls, the wall plates and their connection to the tiebeams, which keep the structure together. This is what the Old Västgöta law puts into words, in my interpretation, 'attached to plates' [*fäst-i-band*].

The investigation suggests that the masonry walls' heights most likely varied. Forsby and Marka, were probably low [around 4.5 m], and Forshem and Gökhem were high [around 6.5 m], and Gamla Eriksberg is so uncertain that it was taken from the wall study. Consequently, we cannot take any heights in the many standing churches in the region for granted. This means further, looking in a larger geography, that only few heights are robustly dated to the mid-twelfth century. The stave churches Urnes, Hopperstad and Kaupanger are examples from the 1130s in Norway, and the interpretations of loose parts, the remains of the wooden walls in Vänga [second half of the eleventh century] and Hällestad [1140s] were similar to the lower masonry naves in Forsby and Marka. The gable tops towards east were made in masonry. These are largely preserved in Gökhem, Marka, Forsby and Forshem. There may have been masonry gables towards west however, this is more uncertain. The only remaining west masonry gable in the five naves is in Forshem, and there, the gable top sits tight up to the subsequent tower, and it is not possible to examine from the outside. I have argued that the carefully finished west wall crest in Gökhem, suggest that there was not a gable top in masonry. This gable top may have been covered with wooden boards instead.

Visible interior wall surfaces in the rooms below, which for certain are from the twelfth century, are lacking. There are glimpses of probably original surfaces in the attics, in the gable tops for example. Likely original surfaces are also observable at the top of the north and south walls in Forshem, in a few places in the attic, and as well in between the tiebeams i.e. over the previous ceiling of boards in Gökhem. These indicate that the first surfaces were of stone and smeared out mortar. They were not straight and not flat however, carefully made smooth. Nice to touch.

There are a number of possibilities for various openings, holes in the boxes. However, only few are certain. The possible entrances in Forsby, Marka and Gökhem collect in the west part of the room. The possible doors gave access to the west end of the room, from the south, west and north directions. There may have been more than one door, it is not impossible with three. This is similar to the wooden remains in the stave church Vänga, which have traces of a door in the nave's southern wall, close to the southwest corner, and notably, a wider door in the middle of the west wall. The doors in the west zone controlled the direction of approach at the site, as well as the entrance situation in the nave room. In the opposite east side of the room, there was the important opening to the chancel. This was likely small, however it has been widened in all four churches and cannot be investigated. Yet, this opening was closed to most visitors. Thus, for the congregation entrance and departure was limited to one end, the back. The space between the three walls [north-east-south] probably created a sense of security. In addition, the perspective lines created by the longer, parallel straight north and south walls and the floor would come together, and powerfully point to the east, the focus, the chancel and altar.

There may have been windows. There are traces of windows high up [on the low] south wall in Marka, and two windows high up on the south wall in Gökhem. There are surviving almost intact openings in the east gables in Marka and Forshem. There may have been additional windows, if these were located in places where the present large windows are today, or in the abolished west parts. There may for example have been openings in the west gable tops. Finally, it is not impossible that the roofs had a wind-eye. The openings have in common that they were put in relatively high up, over eyelevel. The only way to look out from the room was to turn around and look back at the entrances. Most of the room was separated from the world outside. Instead, light came down from high up, the sky. Thus, the room provided distinct experiences, not only of the four horizontal directions, but also the vertical direction. This probably underscored the dynamics in the room.

The interpretations of walls sketch rectangular naves, 'firm heavy boxes' made of stone and mortar, however, with different heights. It is not impossible that some west gable tops were raised in wood instead of masonry. The naves probably had two or possibly even three entrance doors in the west part. Further, a few windows were set high in the middle or east parts of the room. There may have been a window in the west gable too. I argue that these elements created a sense of direction in the room, from-west-to-east-and-up, and that it created a cave-like setting.

### **Chapter 3, Roofs: Adding a lively top**

This chapter focus the individual trusses' construction, and the series of trusses over a room, which form the roofs together with wall plates. Thus, I explored the character of the 'top of the box'. Two questions guided the work, 1) what are the characteristic features of the five roofs, and 2) how do the wooden constructions relate to the room below? I worked mainly from investigations in the attics. First, I find that the five structures, even though varying,

all have the same construction principles. Thereafter, I explore the significance of the relatively large number of tiebeams in the four of the roofs. Finally, I approach the connections between the roof and the room below, in particular in Gökhem.

Carpenters made trusses for the five roofs by attaching rafter-couples to a long, broad and straight tiebeam. Inside this triangle, they supported the rafters with struts. They made each truss in one roof essentially alike, with the same internal structure and thus, they raised roofs of the 'common-tiebeam' form. In four of the five roofs, the carpenters crossed the struts and created lattice patterns, and in these same roofs, they spaced the trusses more tightly over the room than in most common-tiebeam roofs in northwest Europe. A consequence of this is that they used a remarkably large number of tiebeams in each roof. Asking about if the builders were aware of alternative ways to make a roof, I find that the common-tiebeam form was not the only way to make a church roof at this time in northwest Europe and Scandinavia. A few other types of roofs have survived, in for example France and Norway, and in these, the carpenters did not make all trusses in one roof alike. The builders were at home with the idea to separate principal and secondary parts, and did not attach all rafters directly to tiebeams. Instead, they separated tiebeams and rafters with wall- or head plates, in order to use precious tiebeams more sparsely. I argue that the idea and skill to make roofs with separate principal and secondary parts, and thus fewer tiebeams, may have been at hand also in the local communities in Västergötland, yet, the larger number of tiebeams in the church roofs clearly demonstrates what was preferred.

To explore further I examined the intersection between tiebeam, wall plates and masonry wall crests in the two roofs that I interpret are still in situ, Gökhem and Forshem, in detail, and find that the three combined parts formed a firm 'package'. With this in mind, I argue that the broad tiebeams may have had two architectural tasks. The tiebeam was at the same time, the 'top' of an arch- or gate like structure [together with the masonry and wall plates], and the 'base' for a top above [formed by rafter couples and struts]. Moreover, each tiebeam in the five roofs clearly have a front side and a back. Thus, I suggest that the idea 'arch' or 'gate' may have been important. An arch or gate is a strong architectural concept, as it is between 'this side and that side', or 'here and there'. If you pass under, it offers a 'before and after'. I argue that the large numbers of tightly spaced tiebeams over the five naves makes sense viewed like this.

Viewed as a base for the top above, the broad tiebeams, in tandem with wall plates and masonry in a firm package, allow for variation. I find that, even if essentially alike in one roof structure, the trusses in the five roofs vary considerably. None of the five building teams chose to make the same pattern in their 'tiebeam-rafter' triangles. For example, they used different numbers of struts [two, four or six]. However, the trusses have things in common. The carpenters articulated vigorous forms with their struts. In the four roofs with lattice, they grouped the struts towards the middle and created 'fan-shaped' grids. They carefully completed shapes that were 'not-straight' and 'not-precise'. The struts were put in gradually, controlled by an eye measured 'straight-within-limits'. They sealed the parts in place with simple, yet varying joinery. They completed all joints carefully. They made mistakes, but only a few and they fixed them.

They used either wooden dowels or iron nails to lock the joinery. Both dowels and iron nails look alike, they have large heads. Both dowels and nails were put in to hold the parts together. However, notably, the iron nails are both decorative and/or symbolic, as they form patterns within the basic lattice grid in each truss. The carpenters prepared every inch of surface carefully, and largely this was in a flowing and varying way. Thus, there is a sense of billowing in the five attics. However, they were quite able to make perfectly straight and even surfaces when desired, for example at the bottom of the tiebeams. The carpenters followed routine, at the same time their practices allowed for, almost required, leeway. Combining skill, routine and leeway, they created vigorous forms, and a kind of lively variety and diversity. Finally, the timbers in the five roofs were probably, but not for certain, painted white. The tentative analysis suggest that the five roofs were clad in brilliant white lime paint. Possibly, based on a trace in the roof in Mosjö church north of Västergötland, we should imagine red paint enhancing the shapes created by iron nails in all the white.

The building teams in the example Gökhem carefully placed, oriented and brought together different forms and articulations in their roof, and these ‘assembled articulations’ connected to and influenced the masonry ‘box’ below. In particular, the builders paid attention to the four winds. They emphasized the west part of the nave. In Gökhem, they oriented the two most western trusses with their fronts facing east, i.e. the room. The next truss was turned around, with its’ front facing west, as does all the remaining fourteen trusses. Thus, about a meter into the room from the [original] west wall, trusses facing east meets trusses facing west, face-to-face. The entrances in the south and north walls are located just inside this shift. A similar assembly occur in Forsby. I argue that this west/east shift in the roof above marks the nave’s entrance zone. Moreover, in the northwest corner of this zone in Gökhem, there are traces from two things hanging down, rocking back and forth. This may have been for example bells. If so, this zone, or something happening there, was marked with sound.

In Gökhem, the builders also highlighted the middle of the nave-room [between the west and east walls]. The two trusses that were set on each side of the middle line were, unlike the others, adorned with thin, carved beaded lines, which were engraved in the rafters and the [west] bottom edge of the tiebeam. One truss [8] was placed in line with the [west] window, which was set high up on the south wall. I have suggested that there may have been an opening at the ridge, a wind-eye, right over this truss, and/or something was hanging here in the middle of the room. The roof in Forsby point to a similar wind-eye possibility, which also highlighted the middle. The second truss [9], on the east side of the middle, has a number of additional articulations. One strut has a substantial scar, probably from lightning, which is well exposed. A straight black line was painted all along the bottom of the tiebeam. The middle, in the roof in Göhem, thus offers carefully staged ‘modifying’ architectural elements: beams of light, perhaps sky, air and wind or even water in the form of rain, as well as the idea of forceful light and fire, from lightning. Moreover, in this truss the carpenters carved large circular discs at the intersections of the crossing struts. The discs form a larger rhomboid. This is similar to the most eastern truss in the roof, the one next to the gable, and

I argue that these two may form a couple. Their form resemble diagonal crossed timbers with similar circular discs in stave churches in Norway. In the stave churches, a number of crossed timbers with circular discs form a broad ribbon together, set high up and surrounding the inner, elevated part of the naves. I suggest that the two trusses in Gökhem 'surround', or enclose a similar inner zone, i.e. the east half of the nave. The other trusses in this east zone also include decorative forms. As the circular discs, it is the struts themselves, which were carved into various elaborate cruciform patterns. Thus, it is certain that the decorative forms were made in the year 1140 or 1141. The east window, which was set high up in the south wall likely cast a good light on these.

I expected some traces in the east part of the roof in Gökhem, similar to the traces from [interpreted] bells in the west part, which could point to the interior below, for example side altars. I have looked for, but not been able to identify any specific traces, which suggest a connection. However, this does not say for sure that there are not. The last trusses are largely covered with dirt, investigating further requires an excavation.

I argue that the five roofs were not mere roof-carriers. On the contrary, they were probably significant elements of the architecture. A tentative analysis suggest that the roofs were clad in white paint. The billowing, lively, light and see through, vivid top was a sharp contrast to the rectangular, firm and solid cave-like box below. However, even if the two parts were very different, there were similarities; both box and top relate intimately to the four winds as well as the vertical direction. Moreover, the sense of west-east-up dynamic was emphasized by assembled articulations in the examined roof in Gökhem. In particular, this roof articulated a psychological 'barrier' between the entrance zone in the west and the rest of the nave, and another barrier across the middle of the room. Further, two trusses framed, or in my interpretation perhaps protected, the east part of the room. This suggests a hierarchy in the nave room.

#### **Chapter 4, Body and volume: Firm box with lively top**

This chapter work from the interpretation 'firm box with lively top', to investigate the [outside] body-in-space and the [inside] volume-in-room. To do this, temporal aspects were explored in the themes, 'discovery and approach', 'portal and doorway', 'entry and exploration', 'recalled in visual memory', and finally, 'change, the end of the tiebeam game'.

The first theme, about discovery and approach was explored at the site in Gökhem. The building team chose a specific location, which was formed like a 'peninsula' and cautiously and precisely placed the building at this site. The church thereby became a focus point in the landscape. Working from the site's topography and relating this to the nave and its original doorway[s], I found that a relatively flat place with a view, which was located right outside the original west wall, was large enough for a proposed group of people to gather. The place was about the same size area as the original nave inside. There, the churchgoers could participate in outdoor rituals, as the written evidence explain, in front of 'the church door'. This place, I argue, was a significant architectural element in itself. Further, I found that it was

possible to approach the nave's entrances on suitable walking routes from what I interpreted was the original entry to the churchyard. Moreover, this offered a gradual 'discovery' of the entrances, first with a glimpse and finally with a view over the landscape at the tip of the peninsula. Thus, I argue that the doorway in the west wall was probably the main entrance. Moreover, the churches Forsby and Marka, which have similar subsequent additions towards west, also seem to have had a similar flat place next to the original west wall. This supports the idea that the main entrances were in the west walls also in these two churches. When approaching the church in Gökhem, today from the north gate, onto the straight pathway [established in the eighteenth century], a visitor hardly take notice of the interpreted earlier situation.

Taking on the theme about portal and doorway, I examined possible connections between the lattice trusses in the five churches and portals in Norway. I suggest to connect the theme 'lattice trusses as the top of gates' to the similar, but miniature, lattice trusses [with tiebeam, rafters and crossing struts] over entrances with portals in stave churches. The investigation show that the decorative west portals in Nore and Uvdal, and the entrances in the gallery in Borgund, have or had lattice trusses on top. Thus, I argued that lattice trusses were an important part of the articulation of the entry situation. It was an architectural element a visitor would 'pass under' when going from the outside to the inside of a nave. Moreover, the Norwegian miniature trusses over portals combine straight crossed lines, which form strict geometrical rhomboids with the winding animals and plants carved in the portals below. This is somewhat similar to the situation in Gökhem, where the most western truss has straight struts, but all the others have curved lines and some are decorative. Therefore, I interpret; the most western truss in Gökhem may have been part of the original entrance situation. This in turn point to that the gable top was made of wooden boards.

A doorway is a powerful architectural tool, the task was to allow passage between outside and inside the church, or not. In this perspective, it is perhaps not so important if or how the portal was decorated. However, the preserved huge lock on the perhaps original, medieval door [which is reused in the present entrance], and the ironclad outside of this door may have been important. Lock and iron reminds every passing person of the possibly that this door may not allow passage. To some, it could be shut, even locked. Some may pass through and some may be excluded. It was a reminder of possible otherness. To climb over the threshold, meant to belong. It is possible that the activity to open and close the doors, in different capital directions, west, south and north, were significant at different times. Based on the interpretation of the topography, entering through the west entrance likely required a step, or two, up from the ground level of the 'flat place' in Gökhem. Thereby the floor [platform] of the nave [temple] was elevated from the ground. It was detached from the surroundings and placed above the earth. The entry situation offered a play with sharp contrasts of light and dark, open and shut. There was a direct entry. If the doors were open, it was a fluid setting. There was a possibility for both a closed dark space and an utterly open and light space with



a view. The entry offered shelter from rain, but was open to the climate, the cold air and the wind. The rest of the room was likely dark by contrast. I argue that the nave was probably entered slowly. Slowly, eyes adjust.

Inside the nave in Gökhem different elements of architecture, basic [the firm box and lively top] and modifying [e.g. light] worked together. They formed 'assembled articulations'. I have worked from the understanding that they were related to ceremonial activities. Taking two or three steps straight into the room, a churchgoer would be in a position precisely between all three doors, and thus in a crossing, the intersection between the four cardinal directions. Looking up just before this point, this is where two trusses meet with their fronts face-to-face. The narrow shaft between them goes across the room. If the dominating direction was west-east, from the place with a view over the landscape, through the door, towards the altar with relics in the east, the south-north direction was perhaps important for particular activities. I argue that the west entrance-zone was not in a corner, as it may seem to us visiting Gökhem today; the west entrance part of the cave-like nave was a porch, as the room was directly connected to the four winds, views, weather and sky outside.

The size and shape of the nave did not really relate comfortably to human bodies. Looking up, the height was notable. The walls in Gökhem were [visibly] higher than what they are today [because of the vaults]. The room's volume was slightly higher than wide. The volume was standing. The height of the roof was added on, on top of this. The many tiebeam 'gates', were viewed from underneath, instead of climbing in them, as we do today. The nave's volume was large and dictated by symmetry and order. There were straight lines of sight and passage. The opening to the chancel was ten meters ahead. If there was a window in the west gable, the trusses' fronts would have been lit with a direct beam of sunset light, and the room would be lighter in the afternoon. As the sun travelled over the sky each day, the light came into the room differently. This gave the zones and places distinct character. The nave room was definitely part of a temple, and quite unlike a house. It did not provide warmth, and people could not gather comfortably at the fireplace. However, the light-beams from the windows in the south wall aimed at the middle. It probably created something like a heart, a focus, and thus not unlike a hearth, in the room. The light pulls the eye along the room, forward to the southeast and upward towards the windows.

Because people came to church frequently, they would probably 'take possession' of the room. They did not experience it a new, like a tourist, each time. People took different positions in the room at different times and the room provided a multitude of possibilities for experiences. For example, clergy and congregation took part in processions. A procession would suitably take a straight route, from the main entrance directly towards the opening to the chancel. Thus, the line of walking people would follow the central axis and general dynamics of the room. In this activity, the nave's architectural task was to provide a suitable entrance, from the outside to the chancel. The nave-room was a porch to the chancel. If women occupied the north side and men the south side, the cardinal directions controlled their positions in the room. In addition to the sense of 'west-east' dynamic, there was then

also a 'north-south' dynamic, which was a social geometry. Hence, there were gendered relations to zones and focus points. The baptizing ritual likely had a fixed place inside the nave, as written 'by' the font. The font would probably not be too far into the room, at least not past the middle, and I suggest that the place would catch attention viewed from the entrance. I argue that it was probably a focus-point placed in a sunlit position.

The truss just east of the middle of the room in Gökhem marks this in a number of ways. It has a beaded edge, a black line, a scar from lightning, and a number of circular discs inserted in the lattice. The truss next to the east gable wall also have similar circular discs. I interpreted that the middle truss was a powerful psychological barrier, which was not easily crossed. On the east side of the middle, there was likely an abundance of light. Two windows provided light far into the room. I suggested that the two trusses with circular discs was a couple, and that they framed between them the trusses with fancy cruciform shapes over the east part of the room. I argue that this staged a protected zone, from the middle of the nave to the east wall. If so, there was a hierarchy in the room, a protected east, and I compared to the elevated middle rooms in stave churches in Norway, which are also framed by crosses with circular discs. The analysis of the interior show that there was a sense of starting from 'the west', the world outside. Once inside it was going forward [towards east]. There were directions and zones in conjunction with the four winds, a central axis, a middle with a barrier, a focus point or heart, this side and that side in a social gendered geometry, and perhaps a hierarchy in the form of a protected east zone.

The theme 'recalled in visual memory', was explored in an image, the small conceptual picture of a church in the Skog tapestry. The woven walls, floor and roof implies a church. Seen as a shape, the heavy wall-floor contour line seems to form a section through a container with flared brim, and the pictured roof has a lattice pattern similar to lattice trusses in buildings. The chosen design concept 'solid container with flared brim and latticed, textile-like top' was connected to the figure of thought 'ark' or a 'ship'. I compared to other pictures of ships, from the thirteenth or earlier centuries. These show that the correspondence between latticed trusses [both in the Skog picture church and in standing churches] and pictured ships with lattice-sails, in for example the Gotland picture stones and in early medieval tapestries, is striking. However, no early sails are preserved from this early period, and it is not possible to say if the sketched crossing lines in the pictured ships had a practical function, or if they were decoration (Andersen & Bischoff 2016:127). The analyses suggest that by borrowing from boat imagery, the weaver did not invent a new shape for the idea of a church, but relied on a visual similarity with existing pictures of ships and sails.

The tiny little woven church communicates an intense and intimate place for worship. The woven image combines the idea of a realistic church with a metaphorical ark or ship. It is at once specific and generalized. The tapestry with the woven picture of a church interior was most likely itself, part of a church interior. Thus, there was a mirror-relation between the physical tapestry picture and the room and situation it was placed in. The analyses of the Skog tapestry show that there were connections between the textile craft, textile objects, church interiors and church architecture.

Before long people changed the naves' setting. The last part of the thesis examines 'the end of the tiebeam game'. The focus of attention is first on the entrance situation, and thereafter on the nave-room's character regarding the roof. The main object of investigation is the church in Gökhem, however in part also Forshem.

A new structure, with the same height and width as the old nave, was added on towards west wall in Gökhem, probably in the mid-thirteenth century; however, the roof over this, which most likely is the original, is not sampled and dated. In this added on room, there is an original window high up in the west gable, and based on this fact and analyses of the roof-type, I interpret that the trusses were likely visible from the room below when new-built. This new west room was provided with an entrance with a portal in the north wall. This gave access to the outside, the added room was a 'porch'. The new room covers the 'place' in front of the original west wall entirely. Thus, it provided a possibility for shelter, for people participating in those same ceremonies, which had earlier been performed outdoors in front of the interpreted main entrance to the nave. The rituals could still be performed in the very same spot as before, though not under the sky and not with the same view. Later in the medieval period, a chapel [i.e. the present porch] was added in front of the nave's north entrance, and the south entrance was provided with a likely small, wooden porch. The new added structures changed how people entered the church. The activity 'to enter' was prolonged. The entrance situation inside the nave and west-zone with its possible openness and light, and direct connection to the place and view outside, was gone. Consequently, the nave's earlier task to itself be a porch to the chancel was no longer in play, at least not so clearly. There was a porch to the porch.

The people in Gökhem and in Forshem elevated their chancels in the mid-thirteenth century, and I find that these two chancel-rooms were most likely still open to the roofs above, in this period. Both had small window-openings set in the east gables, and the rooms were lit with beams of light, like spotlights, from high above. The altogether new and higher chancel in Forshem had consequences for the nave, as the original opening in the nave's east gable was covered by the new higher chancel. Therefore, masons created a new small opening at the very top of the nave's east gable. Thus, I find that the roof over the nave in Forshem was probably open to the room in the 1260s. The nave-room below was lit with a beam, like a spotlight, from east, high above. The slightly new architectural articulation seems similar to a theatre. I interpret the theme as being all about 'upwards', light came from narrow openings as high as possible. In this mid-thirteenth century period, it seems the nave in Gökhem was not changed.

However, sometime between the mid-thirteenth century and before the 1480s, people in Gökhem and probably Forshem too, remodelled their naves. They put up a ceiling of boards, which they nailed in place from underneath, on to the bottom of the tiebeams. A consequence of this simple measure was that the nave-room became lower. The room was turned into a completely different kind of volume. The direction became less upwards and more forward, towards the east and the chancel. The nave room was no longer like a 'nest', open to the sky, instead it became like a 'shell', closed, in all directions. Another result was

that the tiebeam roof was relegated to a dark attic. From this time, the trusses were no longer visible or valued as important architecture; they were merely practical roof carriers. Moreover, with a ceiling the emphasis of the middle was hidden. The black line across and the lightning in the middle truss in Gökhem was no longer visible. Perhaps, it was at this occasion the psychological barrier guarding the east was erased. Further, it seems that the walls in Gökhem were first plastered on the inside in connection with the ceiling.

Finally, in the 1480s in Gökhem, vaults replaced the ceiling. Since this time, only traces of removed nails in rows, and dust collected between the ceiling's boards, show that they existed. The room was made even a little lower. The middle is not marked it is merely 'between two vaults'. Now, some tiebeams came into direct conflict with the masons at work. The vaults needed space and the tiebeams were cut off if necessary. This was carried out without mercy. Their old meaning was no longer important, perhaps forgotten.

### **Future perspectives**

The overall aim of the study was to contribute to assessments and understandings of architecture in archaeological built environment. The results bring together a new and more detailed view of mid-twelfth century church architectures, resolving archaeological evidence and architectural perspectives. The analysis connected sites, buildings and people. The work illustrates iterated patterns and variations in the buildings' original architectures, which were created in a period before we have documentary evidence for the use of space within and around a local church. This provides a basis for future projects.

The concept 'assembled articulations', which was developed to handle ambiguous traces and multiple possibilities for interpretations of the mid-twelfth century architecture in Gökhem, provides a potential. However, to obtain robust results, further analyses of buildings dated systematically with dendrochronology are necessary. Thus, future quests point to other preserved wooden materials, for example the remarkably large cluster of common-tiebeam roofs in parish churches in Västergötland. Particularly interesting are the stave churches in Norway, as they have not only roofs, but also [dated] walls and in some cases possibly wooden floors. Firstly, regarding the entrance situation, the question if there were more than one, possible three doors in the west parts, and which of these was the main entrance, could probably be taken further in stave churches. My suggestion that there may have been connections between lattice trusses in roofs in Västergötland, and similar, but miniature, lattice trusses over portals in stave churches is one aspect, comparison with the preserved original doorways in Norway, is another. Secondly, the questions regarding the interpreted zones, walking under the 'tiebeam gates' inside the nave-room, i.e. the 'west-entrance', 'middle' and the possibly 'protected east', could be compared to the elevated middle-rooms in a number of stave churches. There the 'St Andreas crosses' with circular discs 'frame' the middle-east zone. Third, original wooden floors and wall surfaces, which are dated independently to the twelfth- and thirteenth centuries are rare. However, both these aspects could be taken further in Torpo and Hopperstad for example. The question if the baptizing font had a fixed

place in the nave, and if so where, could be explored in these churches' preserved floors and walls.

Working from the idea 'site topology' could lead to further understandings of church sites. The analyses of the site in Gökhem, provides a basis for future projects. This includes for example the relations to capital directions, the topography, relations between the ground and original floor levels, 'places' e.g. outside the original west wall, suitable walking routes that offered a gradual 'discovery', and perhaps, views. To obtain robust interpretations, working from 3D laser scans would be optimal.

The analyses of the Skog tapestry that show connections between textile craft, textile objects, church interiors and church architecture, provides a basis for future projects that analyse church architecture working from the viewpoint of textiles, instead of real buildings. There is a rich material in the form of preserved early north Swedish tapestries, which include lattice borders around the textiles themselves, borders around pictured churches and pictured ships with sails. Another textile approach would be to examine textiles, i.e. mainly sails, pictured in other materials such as stones and coins. As the original tapestry cannot be always available for examination, the point cloud from the 3D scan of the Skog tapestry provides unique and rich data for analysis.

### **Homage to ambiguity**

Current understandings of twelfth century church architectures in west Sweden were formed in a crossing between different disciplines and perspectives. These explore different sources however; standing church buildings constitute a large part of the material. Most interpretations of these buildings' architectures are placed under the heading 'Romanesque', and this is interpreted as both a specific style and a period. However, in tandem with the consolidation and frequent use of the notion Romanesque during the twentieth century, the interests have broadened in different directions, beyond stylistic inquiries. Today the Romanesque [style and period], is often taken for granted in larger discussions, for example regarding built environments, societies or historical religious aspects. This work presents new interpretations however; reveals only fragments of the archaeological architectures. The thesis does not argue to replace the Romanesque with a new and better comprehensive theme. However, with the different approach and new methodologies, I find that the notion Romanesque can no longer be taken for granted. The remains have forced me into a 'creative doubt'. The buildings offer surprising news; they have much more to say than historical architectural style, and interpretations of the 'period', is safer to base on annually resolved proxy data, such as tree rings. Therefore, scientifically dated parts of buildings, combined with archaeological investigations and interpretations with a number of perspectives, provides a different basis for discussions in other fields. I hope to have contributed with the insight that today's horizon is not all there is.

Once visible and valued, the roof trusses were downgraded to mere carriers, over 500 years ago. Left in dark attics, they were disconnected from the many changes below. They were

for example, not included in twentieth century restoration projects. Today, medieval roofs in Sweden are surveyed, and they are increasingly included in discussions about the heritage church monuments. To us, approaching them with new interest, the roofs are archaeological, alien; we understand only parts of how they were significant, and it is obviously important to seek to know them better in order to provide good care. However, the fact that they were literally ‘in the dark’, not understood, and not prioritized in restoration projects, resulted in that they were untouched. Thus, they form the rich archaeological material that interests us today. Learning from this, more knowledge and interest needs to develop in tandem with respect and awareness.

The year 1140, when people created a new church in Gökhem, is now 877 years ago. In a distant future, 877 years from now in the almost unimaginable year 2894, will someone then be curious and examine our doings in the same building in Gökhem? A most important ‘future perspective’ concerns the physical monuments’ future. This depends on discussions in the field conservation. A consequence of the twentieth century restorations and maintenance projects was that the diversity was reduced. As we now try to fit this heritage, which have a Swedish national identity, into an increasingly complex world with many identities, it is my hope that the thesis provides support for new discussions. The issues are now as ever before, about managing both continuity and change. From the perspective of a buildings archaeologist, doing next to nothing is definitely a good idea. Yet, we are without doubt on route to future changes. Today, the task includes a [relatively] new tension, as the idea ‘conservation’ sets out, seeks to conserve [preserve or maintain] objects that inevitably will change. The thesis is an argument for assessments that allow for ambiguity, diversity and multiple interpretations in the monument construct. Further, the work argues for conservation measures that both secures a continuity and welcomes future changes. Measures that involve both people and buildings. With this study I hope to have strengthened archaeology and architecture in the field conservation.







# Sammanfattning

Avhandlingens övergripande syfte är att skapa nya tolkningar av arkitektur i arkeologisk byggd miljö. Analyser av ett 'case', som består av fem kyrkor i Västergötland, Forsby, Forshem, Gökhem, Marka och Gamla Eriksberg, relaterar till kyrkoarkitektur som skapades vid 1100-talets mitt. I centrum av undersökningen befinner sig de fem kyrkornas långhus eftersom det på deras vindar finns välbevarade taklag daterade med dendrokronologi till en begränsad period, 1134– ca 1160 (Seim et al 2015). Från denna tid i Västergötland saknas skriftliga källor som kunde ha berättat om arkitekturen. Jag närmar mig därför det fysiska materialet med byggnadsarkeologiska metoder och arkeologisk teori. Som jag ser det, utgör aktiviteten att bygga fem långhus på olika platser i samma region, 'upprepade, likartade handlingar' vilka utfördes för snart 900 år sedan. Lämningarna som finns kvar är alltså resultatet av en serie likartade aktiviteter i det förflutna (Cornell & Fahlander 2002). Analyserna baseras till största delen på undersökningar och dokumentationer i form av ritningar och skisser. Dessa utgör avhandlingens största empiriska material, men jag har också haft tillgång till ett punktmoln från en 3D laserskanning av kyrkan i Gökhem. Jag använder, i mindre omfattning, några andra tidigmedeltida material från andra geografier, dels från byggnadsundersökningar i stavkyrkor i Norge, och dels en närstudie av en bild av en kyrka i en vävd textil, bonaden från Skog i Hälsingland. Skogbonaden ingår i Historiska museets samlingar i Stockholm.

Frågeställningarna kretsar kring den arkitektur som människor skapade, och jag försöker koppla samman platser, byggnader och människor. Målet är att med hjälp av de fysiska lämningarna utforska förhållanden mellan olika arkitektoniska element i det förflutna. Begreppet 'arkitektur' är förhållandevis öppet, det finns olika sätt att arbeta med, skapa eller skriva om arkitektur. Studier i arkitektur kan å ena sidan beskriva byggnader eller fysiska strukturer, med det kan också lyfta fram idéer och aktiviteter, som skapande och byggande. Ett sätt att se på arkitektur är att arkitektur 'skapar plats för' människors kroppar och saker (Grosz 2001; Unwin 2009). I avhandlingen ser jag på arkitektur så, som en fysisk ram för människors varande och görande. Den dåtida arkitekturen i de undersökta långhusen var ett verktyg för olika aktiviteter. Arkitekturen blir med detta synsätt betydelsefull, eftersom den är allestädes närvarande och påverkar människor på ett avgörande sätt, men också mindre högtidlig, den blir vardaglig.

## **Mellan gamla byggnader och oss**

I kapitel 1 ställs de fem kyrkorna in i fyra olika sammanhang vilka beskrivs med hjälp av tidigare studier. Först tecknas en bild av Västergötland under 1100-talets mitt. Denna visar att de fem långhusen restes i samhällen som sannolikt var väl organiserade. De flesta var

troligen kristna. Skara stift, med utsedd biskop ingick formellt i Katolska kyrkans stora område. Västgötarna hade en kung och troligen en gemensam lag, även om det är osäkert om denna var nedtecknad eller muntligt traderad av en lagman (Wiktorsson 2011a). Det pågick en stor kyrkobyggnadsaktivitet. En domkyrka uppfördes i Skara och två Cistercienserkloster grundades, i Varnhem och Gudhem. Lokala samhällen uppförde ett stort antal mindre kyrkor. Vid nedtecknandet av Äldre Västgötalagen på 1220-talet räknas över 500 kyrkor upp (ibid). De fem kyrkorna ingår i det relativt stora antal, ca 150, som fortfarande har bevarade tidigmedeltida delar (Gullbrandsson 2008b). Det byggdes sannolikt många kyrkor med väggar av trä (Lagerlöf 1985), men ett relativt stort antal kyrkor byggdes med väggar av sten. Att döma av utgrävningar uppfördes andra typer av byggnader i stort sett uteslutande i trä, både i de två städerna Skara och Lödöse (Carlsson 2007) och på landsbygden (Augustsson 1995). Det betyder att kyrkorna av sten som uppfördes under 1100-talet, var relativt många, nya och främmande gestalter, i ett landskap som i övrigt troligen var uteslutande möblerat med träkonstruktioner.

Det nuvarande kunnandet om medeltida kyrkoarkitektur i Västergötland befinner sig till största delen inom det konstvetenskapliga forskningsområdet (Dahlberg 1998). Kyrkobyggnaderna från tidig medeltid har studerats under hela 1900-talet och forskningen som har svenska sockenkyrkor i focus är omfattande. De konstvetenskapliga analyserna infogar byggnaderna nästan utan undantag under rubriken 'Romansk stil', och denna kopplas till en europeisk formvärld (Lindahl 2008). I ett Europeiskt perspektiv finns ett relativt stort antal medeltida tak bevarade på sockenkyrkornas vindar i Sverige (Courteney & Alcock 2015). Medeltida tak har uppmärksamrats under 1900-talet, dock i mindre grad. Vetenskapliga undersökningar har till exempel belyst konstruktionerna, och diskuterat frågor om hur de kan ha tillverkats (Sjömar 1988). Frågor om hur medeltida taklag bär last har diskuterats (Thelin 2006). Även taken har lyfts in under rubriken Romanskt, eftersom liknande tak finns på andra platser i Europa (Lindahl 2008). Vindsmiljöernas och taklagens koppling till arkitekturen är endast belyst i ett fåtal mindre svenska studier. Avhandlingen tar utgångspunkt i insikten, vilken bygger på ett publicerat exempel från Östergötland (Sjömar 1995), att de fem taklagen i Västergötland troligen var synliga i rummen från början.

Det andra sammanhanget som undersöks i kapitel 1 handlar om den Romanska stilen som tankefigur. Frågan som ställs är om idén om det Romanska kan kopplas till avhandlingens utforskning av kyrkoarkitektur? Undersökningen visar att de fem kyrkornas långhus utan tvekan kan placeras in i stilperioden Romansk, eftersom de i princip passar in tidsmässigt, både från ett europeiskt perspektiv (Ferne 2014), och ett västsvenskt (Dahlberg 1998). Deras stilistiska uttryck är däremot svårare att identifiera entydigt som Romanskt, eftersom byggnaderna innehåller så få dekorativa inslag. Samtidigt har definitionen av Romansk stil på senare tid kritiserats för att vara både oprecis och vag, även stereotyp (O'Keeffe 2007). Mot denna bakgrund finner jag att de fem långhusen bara med viss tvekan kallas Romanska, och att tankefiguren Romansk stil inte för avhandlingens frågeställningar om arkitektur framåt. I avhandlingen söker jag andra vägar.

Det tredje sammanhanget i kapitel 1 skisserar några exempel på andra förhållningssätt till historiska byggnader som har varit inspirerande, särskilt inom fältet byggnadsarkeologi. Exempelen lyfter fram studier av hur byggnadsdelar kan ha tillverkats, formats och sammanfogats (Almevik & Melin 2015). Andra studier fokuserar på betydelsen av relationer mellan detaljer och helheter i arkitekturen (Eriksdotter 2005; Green & Dixon 2016; Hansen & Le Roy 2012). Jag uppmärksammar också att dendrokronologi används i allt större utsträckning för dateringar (e.g. Alcock & Miles 2013).

Det fjärde och sista avsnittet i kapitel 1 syftar till att förstå de fysiska lämningar som jag mötte när de fem kyrkorna undersöktes. Avsnittet uppmärksammar de restaureringar som genomfördes under 1900-talet, och försöker sätta in dessa i ett sammanhang. De fem kyrkorna är inte ensamma om att ha restaurerats, många andra sockenkyrkor restaurerades också, i hela Sverige. Frågorna i avsnittet handlar om hur många kyrkor som restaurerades och när, på vilka grunder, vem som ansvarade och hur åtgärderna utfördes. Det framgår att ett mycket stort antal sockenkyrkor i hela Sverige förändrades, särskilt i perioden 1920–1950 (Åman 2008; Bedoire 2013). Åtgärderna var inte sällan omfattande. Vidare var det en liten grupp arkitekter och antikvarier, skolade i konsthistoria och utbildade av samma [två] lärare [Curman och Lundberg], som ansvarade för projekten. Några kände varandra sedan studietiden och hade gemensamma erfarenheter. Resultatet av restaureringarna blev att byggnaderna passades in i likartade kostymer. En konsekvens av att det var så många restaureringar som genomfördes i ett nationellt sammanhang under en relativt sett kort period, är att mångfalden, byggnadernas alla olika lager av om- och tillbyggnader och varierande arkitektoniska uttryck minskade.

Sen dess har förhållningssättet förändrats, vi säger idag att vi ska bevara byggnaderna på deras egna villkor (Åman 2008). Åtgärderna under 1900-talet präglar dock fortfarande byggnaderna i hög grad. När vi nu står inför att anpassa monumenten, som fortfarande förmedlar 1900-talets uppfattning om en Svensk nationell identitet, till en mer komplex värld med många identiteter, är nya tolkningar av kyrkornas skiftande förflutna särskilt viktiga. I de tidigare restaureringarna var det framförallt fasaderna och interiören åtgärdades, kyrkornas vindar och taklag ingick oftast inte i projekten. Vindarna med taklag erbjuder därför en särskilt god möjlighet för avhandlingens utforskning.

### **Väggar: som formar en stadig låda**

I kapitel 2 presenteras de fem långhusens väggar, gavelrösten och öppningar i dessa, det vill säga dörrar och fönster. Jag har använt mina egna undersökningar av framförallt vindarna murkrön, gavelrösten och tak och kombinerat dessa med arkitekters och antikvariers anteckningar från tidigare restaureringsprojekt som finns arkiverade i Antikvarisk-topografiska arkivet, Riksantikvarieämbetet [ATA]. Forsby kyrka lyfts fram som ett exempel. Frågan som ställs är, över vilka väggar restes det nytillverkade taklaget året 1135? Därefter speglas resultatet från Forsby tematiskt i de andra kyrkornas långhus. Undersökningen visar

att de tunga väggarna i fyra av de fem långhusen, Forsby, Gökhem, Marka och Forshem formade likartat proportionerade rektangulära rum. Långhusens rumsbredder är relativt lika rumsbredder i lämningar efter träkyrkor eller andra träbyggnader i regionen som undersökts i arkeologiska utgrävningar. Det betyder att de tak som täckte rummen är jämförbara. Kyrkornas långhus placerades mer eller mindre i överensstämmelse med de fyra väderstrecken. I Forsby har jag funnit det sannolikt att väggarna var lägre från början, och att de senare har förhöjts. Det är möjligt att även Marka kyrka var lägre från början. Jag har kommit fram till att väggarna i Forshem och Gökhem antagligen hade den höjd de har idag. Väggarna i långhuset i Gamla Eriksberg fick lämnas utanför undersökningen eftersom de är så kraftigt ombyggda. Undersökningen pekar alltså på att det byggdes långhus med olika höjd vid 1100-talets mitt. Det är inte säkert att alla gavlar hade murade röstben. Rummens bredd är ganska lika bredder i lämningar efter träkyrkor eller andra byggnader i regionen som undersökts i arkeologiska utgrävningar. Långhuset placerades mer eller mindre i överensstämmelse med de fyra väderstrecken.

Entréer till långhuset var koncentrerade till den västra delen av rummet, och undersökningen lyfter fram att det inte är omöjligt och det att det fanns både två och kanske tre dörrar från början. De fönsteröppningar som finns spår efter var satta högt upp, över ögonnivå i mitten eller östra delen av rummet, samt i östra gavelröstet. Det kan ha funnits fönster även i västgavlarna.

Arkitektoniskt skapade långväggarna sannolikt en känsla av riktning i rummet, från väster med dörröppning[ar], mot öster, och samtidigt uppåt mot ljus från fönsteröppningar. Det finns inga lämningar eller direkta spår efter ingången till koret kvar i någon av de fyra östra långhusväggarna, men oavsett hur denna öppning var utformad, var den troligen stängd för de flesta. Slutligen tolkar jag att det ursprungliga rummet skapade en känsla av att befinna sig i en grotta.

### **Tak: lägger till en livlig topp**

Kapitel 3 ägnas åt taken. Det handlar dels om takstolarnas konstruktion och former, och dels om hur de fördelar sig horisontellt, det vill säga över ett rum. Frågor som ställs är, vad är karaktäristiskt för de fem taken? Och hur förhåller sig taken till rummen de spänner över? Jag har i första hand använt egna undersökningar av de fem taken för analyserna, men kapitlet bygger delvis på andras inventeringar och dokumentationer. Jag har funnit att alla fem taken kan placeras under rubriken 'Common-tiebeam roof', det vill säga tak som har takstolar med bindbjälke i varje takstol. Högbenen stöttas av två eller flera stödben. I fyra tak korsar ett antal stödben varandra, och i ett tak, Forshem, finns bara två stödben vilka lutar utåt-uppåt. Inget av de fem takens takstolar har hanbjälke. Fyra tak består av ett relativt stort antal takstolar jämfört med andra liknande tak. Det betyder att takstolarna står placerade mycket tätt, de har ett litet cc-avstånd. För att utforska detta närmare har jag undersökt mötet mellan väggen och taket i detalj. I de två tak som jag har tolkat fortfarande är kvar på plats, 'in situ', Gökhem och Forshem, är murkrönet fört upp förbi bindbjälken och

väggbandet. Mötet mellan bindbjälke, väggband och murkrön bildar därför tillsammans en sammanlänkad enhet. Som en följd av detta tolkar jag att de kraftiga bindbjälkarna arkitektoniskt hade två 'uppgifter'. Dels bildar bindbjälken, väggbandet och murkrönet tillsammans något som kan liknas vid övre delen av en 'portal'. Bindbjälkarna kan då ses som ett antal uppradade portalöverstycken vilka man rörde sig under. Dels utgör bindbjälken nedre delen av en takstol, där den utgör fäste för högbenen och stödbenen. Varje takstol har givits en tydlig fram- och baksida vilket tyder på att riktningen har haft betydelse.

Ovanför bindbjälken finns utrymme för ganska stora variationer i utformningen av takstolstrekanten. Byggarna varierade till exempel antalet stödben, och alla de fem takens takstolar är olika uppbyggda. Samtidigt har de vissa karaktärsdrag gemensamt. Stödbenen grupperades mot mitten av takstolarna och de korsande stödbenen är placerade 'spänstigt' och lutar lite utåt i relation till varandra, det ser ut som om det växer uppåt i solfjäderformer. Stora smidda järnspik användes i stället för dymling av trä på vissa utvalda ställen, vilket formade dubblingar, till exempel romber av olika storlek i takstolarnas gallerverk av korsande stödben. Hantverkarna utförde välgjorda konstruktioner, men dessa har inte rätta vinklar och är inte raka, samtidigt som de varierar något även inom ett tak. Stödbenen placerades sannolikt med ögonmått, men inte helt tillfälligt, det var inom gränser. De följde sannolikt rutiner vilka tillät variationer. Antagligen, målades träkonstruktionerna vita med limfärg eller kalk. Enstaka prover från Gökhem visar på att färgen innehåller kalk, men fortsatta studier behöver genomföras.

Taket i Gökhem är ett exempel på att olika markeringar och artikuleringar sattes samman på olika platser i takets horisontalplan. Jag har arbetat utifrån insikten att dessa kan ha varit kopplade till rummet under. I taket i Gökhem uppmärksammades väster, mitten liksom hela östra delen av rummet.

Jag argumenterar i kapitlet för att takstolarna inte endast bar taket, de var betydelsefulla i interiören. De utgjorde, med sin livliga, böljande, lätta och genomsiktliga galler-karaktär, en skarp kontrast till de tunga, tjocka, solida och rätvinkliga väggarna under. Men tak och väggar hade också likheter. De relaterar både till de fyra väderstrecken i horisontalplanet, och vertikalt uppåt. Riktningen väst-öst-uppåt i rummet understryks i Gökhem av de olika kombinationerna av artikuleringar och markeringar.

### **Kropp och volym: en stadig låda med livlig topp**

I kapitel 4 undersöker jag exteriören [byggnadskroppen och platsen] och interiören [rummet och dess volym], i ljuset av fyra arkitektoniska teman. Dessa utgör en sekvens av händelser, 1) upptäckt och annalkande, 2) inför porten och inträde, 3) utforskande av rummet samt 4) återkallat i minne. Slutligen, i kapitlets sista avsnitt diskuteras några förändringar som kastar ljus bakåt, på den tolkade 1100-tals situationen.

Det första temat, 'upptäckt och annalkande', undersöks på kyrkogården i Gökhem och bygger till största del på en analys av 3D laser skanningen av marken, topografin, men andra källmaterial bidrar också, skriftligt källor och äldre och nyare kartor avslöjar till exempel att

den nuvarande ingången tillkom på 1780-talet. I den topologiska analysen kopplas platsens topografi, kyrkogårdens ingångar och långhusets troliga entréförhållanden på 1100-talet samman. Jag försöker lyfta fram den tidigare situationen, och i denna framträder platsen framför den ursprungliga västväggen som särskilt betydelsefull. Baserat på markanalysen argumenterar jag för att det ursprungligen fanns en entré i västväggen i Gökhem. Jag kommer fram till att det sannolikt fanns det tre dörrar i västra delen i Gökhemslånghus från början. En dörr i västväggen, en dörr i norrväggen, och en i söderväggen.

Det andra temat, 'inför porten och inträde', för avhandlingen till en helt annan geografi och nya undersökningar i stavkyrkor från 1100-talet i Norge. Takstolarna med korsande stödben i Västergötland kopplas till liknande små, 'mini-takstolar', vilka är placerade över portaler i stavkyrkorna Borgund, Nore och Uvdal. Resultatet pekar på att det kan finnas förbindelser mellan takstolar med bindbjälke och korsande stödben i Västergötland, vilka man rörde sig under, och liknande portal-överstycken vid entréer till långhus i stavkyrkor i Norge.

En dörröppning är ett kraftfullt arkitektoniskt verktyg. Dess uppgift är att tillåta [eller inte] passage mellan ute och inne. Om jag har rätt i tolkningen att det fanns tre dörrar i västra delen av långhuset i Gökhem, erbjöd den ursprungliga situationen med direkt ingång från ute till inne en lek med skarpa ljuskontraster. Från bländande ljust till kontrasterande svart mörker. Det fanns möjlighet att skapa ett stängt och mörkt utrymme mellan de tre dörrarna, liksom en nästan helt öppen och flödande ljus situation, med en vy över landskap långt borta.

Det tredje temat, 'utforskande av rummet', undersöks i långhuset i Gökhem. Jag utgår från kombinationer av resultaten i kapitlen 2 och 3. Som utgångspunkt för jag alltså fram att långhus-rummet utgjordes av ett strikt, rätvinkligt och tung botten. Rummet är en låda med [möjligen flera] dörrar i västra delen och ljusinsläpp högt upp. Därefter lägger jag till att lådan hade en helt annorlunda, kontrasterande lätt, mångsidig och livligt böljande 'topp', dvs taket. Jag har tolkat att en besökare trädde in i västra zonen. Den dominerande riktningen väster-öster var sannolikt tydlig, och gick från den ljusa platsen med en vy utanför västporten, rakt fram och siktade mot öster, både mot altaret i koret och sannolikt också upp mot ljuset i sydöstra delen av rummet. Långhuset var på så sätt en förhall, en betydelsefull transportsträcka [till exempel i procession] till koret. Rummet i Gökhem hade en hög, stående rumsform, med taket var rummet betydligt högre än idag. I horisontalplanet dominerades det av symmetri och stram ordning. Väster, öster, mitten, kanske också norr-söder uppmärksammades. Det fanns möjlighet för raka siktlinjer och passager. Olika zoner markerades i taklaget som verkade i kombination med ljusinsläpp från de högt sittande fönstren. Takstolen som placerades i mitten av långhuset i Gökhem, artikulerar och markerar mitten på flera sätt. En målad rak svart linje under bindbjälken, kontrasterar en vit målad yta. Ett stödben i takstolen är märkt av en skada, sannolikt från ett blixtnedslag. Ärret är placerat synligt på framsidan och var sannolikt väl belyst av ett fönster alldeles under. Denna takstol [9] och den som placerats ytterst mot öster [16], tolkar jag utgör ett par. Dessa två takstolar hade båda från början nio stycken runda diskar, cirka 35 cm i diameter, infogade i stödbenens

korsande möten. Jag finner att den mittersta takstolen var viktig eftersom den är så speciellt artikulerad, och att paret av lika och kraftigt artikulerade takstolar markerar gränserna för östra delen av långhus-rummet. Jag argumenterar för att östra delen kan ha utgjort en särskild zon, och gör jämförelser med de förhöjda 'mitt-rummen' som finns i många stavkyrkor i Norge. Mitt-rummen markeras med liknande stora korsande former, som har runda diskar i korspunkterna i ungefär samma storlek som i Gökhem. Mitt och östra delen av rummet var troligen ljusare i jämförelse med västra delen.

Analysen av rummet i Gökhem lyfter fram en känsla av rörelse som startade i väster, i världen utanför. Väl inne fortsatte rörelsen framåt mot öster och uppåt. Rummet var uppdelat i förhållande till det fyra väderstrecken, en central axel, en mitt med en markerad psykologisk barriär och kanske också en belyst, eller på annat sätt markerad mittpunkt, likt ett rummets hjärta. Den från skriftliga källor omtalade kvinno- och manssidan pekar på att det troligen också fanns en social geometri i rummet, zoner i norr- och söder. Om den östra delen var en utpekad zon vilken var inspänd mellan markerade gränser, tyder det dessutom på en hierarki i själva långhuset, inte enbart en värdeskillnad mellan långhus och kor.

Det fjärde temat, 'återkallat i minne', diskuteras framför en liten konceptuell bild, en kyrka i en vävd textil, bonaden från Skog i Hälsingland. De vävda väggarna, golvet och taket antyder en kyrkobyggnad i en längdsektion. En kraftig tjock linje tecknar väggar och golv, och dessa formar tillsammans något som kan liknas vid en låda med breda lutande brätten. Taket i den vävda kyrkan är återgett med samma gallerliknande korsande linjer som i takstolarna i fyra av taklagen. Det är tecknat med lätta, tunna linjer och den vita linnevarpen i mellanrummen träder fram. Det antyder genomsiktighet. Över taketsnock syns flera livliga fåglar tecknade.

Bild-konceptet, 'solid behållare med breda lutande brätten och lätt topp tecknad av tunna korsande linjer' kopplades i undersökningen till den för kyrkor närliggande tankefiguren ark eller skepp, och jämfördes med andra skeppsbilder, både äldre eller från ungefär samma tid. Dessa visar att det finns flera likheter med bilder som tecknar segelskepp, vilka har segel med korsande eller rutande linjer, och några av dessa har fåglar som sitter på masttoppen. Bildstenarna från Gotland innehåller många exempel med skepp som har segel med korsande diagonala linjer. Sparlösastenen i Västergötland har en skeppsbild, med segel med ett kors, och livliga fåglar över masten. Avbildningar av skepp med segel med rutor eller romber, och fåglar i masttoppen, finns också i vävnaderna från Överhogdal och Kyrkås. Det finns inga bevarade lämningar av tidigmedeltida segel, och det är inte möjligt att avgöra om de korsande linjerna i seglen hade en praktisk funktion eller om det är ren dekoration (Andersen & Bischoff 2016). Analysen kommer fram till att kyrkan i Skogbonaden sannolikt lånar vissa drag från äldre och samtida bilder av skepp med segel.

Den lilla bilden av en kyrka i Skogbonaden innehåller också människor, i långhuset så väl som utanför västväggen, och i öster står en präst i koret. Det ser ut som om det pågår aktivitet. I den lilla men konceptuellt starka bilden av en kyrka kommuniceras en intim plats. Eftersom den lilla bilden är samtidigt specifik och generell tolkar jag att bilden kombinerar tanken på en realistisk kyrka med den metaforiska idén om en ark och/eller ett

segelskepp. Vävnaden själv var sannolikt en del av en kyrkointeriör (Nockert 1995). Med tanken att vävnaden var uppsatt på väggen i en kyrka eller hängde framför altaret, och var betraktad av församlingsmedlemmarna, uppstår en spegling mellan betraktarna i det verkliga rummet och de avbildade människorna. Skogbonadens kyrka pekar på att det kan ha funnits kopplingar mellan textilt hantverk, textila objekt, kyrkointeriörer och uppfattningar om kyrkoarkitektur.

Kapitlets sista avsnitt skisserar några förändringar som hade betydelse för den ursprungliga situationen. Först riktas uppmärksamheten mot entrésituationen, därefter taken och rummets avgränsning uppåt. Kyrkan i Gökhem är fortfarande i centrum, men undersökningar i Forshem bidrar också till tolkningarna.

Det uppfördes en ny tillbyggnad framför västväggen i Gökhem, under mitten av 1200-talet. Det tillbyggda rummet har ett fönster i gavelröset mot väster, och därför tolkar jag att taket fortfarande var synligt i det nya rummet. Rummet utrustades med en entré till utsidan i norra väggen. Tillbyggnaden var därmed en förhall till långhuset. Tillbyggnaden är placerad precis över platsen framför den troliga västra kyrkporten, vilken identifierades i den topologiska analysen. Jag tolkar det som att det tillbyggda rummet erbjöd skydd för väder och vind när församlingen deltog i samma aktiviteter som hade utförts på samma plats tidigare under bar himmel.

Senare under medeltiden, men sannolikt före 1480-talet, byggdes ett kapell framför den [troliga] norra entrédörren till långhuset [detta är det nuvarande vapenhuset med ingång]. Den södra ingången till långhuset, som det finns spår av i väggen, fick också en tillbyggnad, fast det är oklart när. Denna var av trä och den finns inte kvar idag. Bevis på att den funnits är att den nämns i skriftliga material från 1700 och 1800-talen. De tre tillbyggnaderna ändrade hur församlingsborna trädde in i sitt tempel. Aktiviteten 'att gå in' förlängdes och förmedlades genom tillbyggnaderna. Den direkta kopplingen, mellan ljust och mörkt, inne och ute var borta. Långhusets tidigare funktion som förhall till koret blev sannolikt inte längre tydlig.

Under mitten av 1200-talet förhöjdes koret i Gökhem, och nästan samtidigt byggdes ett helt nytt kor i Forshem. Dateringarna bygger på dendrokronologiska analyser av de nya taken i bägge koren. De nya koren hade öppningar i östra gavelröstena, och därför tolkar jag, liksom i den nya förhallen i väster i Gökhem, att taklaget fortfarande var öppet mot rummet. De små fönsteröppningarna som sitter så extremt högt kastar in ljus, ner mot rummet som spotlights. Det nya koret i Forshem var sannolikt högre än det tidigare, och i samband med förhöjningen, byggdes östra gavelröset till långhuset om, det fick en ny öppning allra högst upp. Den tidigare, större öppningen med fals och hängslen för en lucka, som fortfarande är bevarad, leder nu in till korvinden. Interiören kan tolkas arkitektoniskt som att den var helt och hållet fokuserad på 'uppåt österut', så högt som möjligt. Jag har inte funnit några spår som pekar på att situationen i långhuset i Gökhem förändrades vid denna tid.

Någon gång mellan ombyggnaderna vid 1200-talets mitt eller slut, och innan 1480-talet, byggde dock församlingen i Gökhem, och troligen också i Forshem, om långhuset. De satte helt enkelt upp ett innertak av brädor. De fäste brädorna till bindbjälkarnas undersidor med



järnspik. Denna förhållandevis enkla åtgärd hade stora konsekvenser för rummet. Rums- höjden blev betydligt lägre och rumsvolymen därmed helt annorlunda. Riktningen blev inte längre österut-uppåt, utan österut-framåt. Konceptuellt tolkar jag att rummet inte längre var som en 'ark' eller 'skepp', skyddat men öppet mot himlen. Rummet inneslöt i stället, som i ett skal, skyddat och slutet även uppåt. Långhuset blev instängt, i både väster och uppåt, alla riktningar.

Slutligen innebar innertaket att takstolarna hänvisades till den mörka vinden. I och med brädtaket blev takstolarna enbart 'takbärare'. Markeringarna i den mittersta takstolen, den svarta linjen och blyxtnedslaget förpassades till det dolda. Kanske det var nu som den psykologiska barriären och 'östra zonen' togs bort. Det finns ett äldre putslager bevarat på väggarnas insida, vilket är synligt mellan bindbjälkarnas undersida och valvkappornas översida. Samma lager går in i den västra fönsternischen, som fortfarande kan observeras från vinden. Det verkar därför som om det två fönstren i södra väggen behölls ytterligare en tid. Putsdraget antyder också att innerväggarna inte var putsade innan. Jag tolkar det som att det sannolikt var först i samband med innertaket som väggarna putsades.

Senare, under 1480-talet (Hernfjäll 2011), ersatte valv av sten innertaket av brädor. Det som finns kvar idag av brädtaket, och visar på att de fanns en gång, är spåren efter borttagna spikar i prydliga rader, och strängar av damm tvärs bindbjälkarnas undersidor, samlad mellan brädorna före 1480-talet. De murade valven gjorde rummet ännu lite lägre. Den tidigare så viktiga mitten befinner sig nu helt enkelt 'mellan två valvkappor'. Valvens höjdpunkter delar rummet på ett nytt sätt. När valven byggdes kom murarna i direkt konflikt med några av de gamla bindbjälkarna. Valven behövde plats och bindbjälkarna kapades av där det var nödvändigt. Detta utfördes utan pardon och den gamla betydelsen, förmedlad med markeringar och artikuleringar i taket verkar ha varit helt bortglömd.

### **Diskussion: en hyllning till mångtydighet**

Frågeställningarna har kretsar kring den arkitektur som människor skapade, och jag har kopplat samman platser, byggnader och människor. Målet har varit att bidra till värderingar och förståelse av arkitektur i arkeologisk byggd miljö. Med hjälp av de fysiska lämningarna har jag utforskat förhållanden mellan olika arkitektoniska element i det förflutna. Resultaten samlar en ny och mer detaljerad bild av 1150-talets kyrkoarkitektur i Västergötland. Avhandlingen visar på itererade mönster och variationer i byggnadernas ursprungliga arkitektur, skapad i en tid från vilken vi inte har skriftliga källmaterial som kan berätta. Resultaten kan utgöra en grund för fortsatt utforskning, vilka sammanfattas i tre punkter nedan:

Först erbjuder tanken på 'assembled articulations', sammanfogade artikuleringar och markeringar, möjligheter i nya byggnadsarkeologiska projekt. Det är ett sätt att hantera tve tydiga spår, i kombination med många möjliga tolkningar. För att uppnå mer robusta tolkningar behöver undersökningarna kopplas systematiskt till dendrokronologiska analyser. Därmed pekar ny utforskning mot källmaterial av trä, till exempel klustret av tak som bevarats i Västergötland, och som inventerats av Gullbrandsson (2015). Särskilt intressanta

är också stavkyrkorna i Norge, eftersom där finns dessutom väggar och golv av trä som antingen redan är, eller kan dateras med dendrokronologi. Frågan om entrésituationen, mitten och östra zonen i långhuset kan antagligen föras vidare baserat på undersökning av stavkyrkor.

Vidare finner jag att djupare förståelse av kyrkplatserna skulle kunna uppnås med topologiska analyser. Fortsatta undersökningar kan till exempel belysa entrésituationen. Det handlar om de fyra väderstrecken, topografin, relationerna mellan golvnivåer och marknivå, plats för ceremonier utomhus, och gångstigar som visar hur människor närmat sig kyrkan. 3D laser skanning ger optimalt underlag för sådana studier.

Till sist visar analysen av Skogbonaden på möjliga kopplingar mellan textilier och arkitektur. Ny utforskning av medeltida arkitektur som tar utgångspunkt i textila material och textila perspektiv är en spännande tanke. Det finns ett unikt och bildrikt textilt material att arbeta med i Sverige, utöver Skogbonaden. När Skogbonaden endast sällan kan göras tillgänglig för okulär observation ger det 3D laser skannade punktmolnet goda förutsättningar för fortsatta närstudier. Ett annat 'textilt' material utgörs av bilder av textilier, till exempel segel, i sten eller på mynt.

Min utforskning har försökt koppla samman, tolka och analysera platser, byggnader och människor i det förflutna. Jag förstår att det inte är möjligt. Arkitektur från 1150-talet var mångsidig, människor är och var olika, och de fysiska lämningarna är både icke-permanenta, stumma och mångtydiga källmaterial. Ändå är det, som jag ser det, viktigt att göra nya tolkningar vilka baseras på empiriska studier, inte bara för att förstå bättre, utan för att ta hand om byggnaderna på bästa sätt. Avhandlingen vill bidra till 'uppdaterad' medvetenhet om monumentets förflutna för att kunna problematisera nya kulturvårdande projekt med nya målsättningar, och en mångfald, mångtydiga identiteter. Med avhandlingen vill jag särskilt bidra till diskussionen om hur taken, 'de dammiga gamla sakerna i mörkret', ska inkluderas i en framtida bild av monumentet. Det är därtill min förhoppning att avhandlingens innehåll och arbetssätt ska stärka banden mellan arkeologi, arkitektur och kulturvård.



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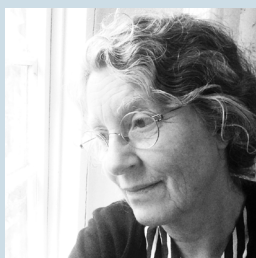


## Interpretations of old wood

Figuring mid-twelfth century church architecture in west Sweden

This thesis explores mid-twelfth century church architectures in west Sweden. The architectures are investigated in the light of a case, five parish churches' naves, in particular their attics and surviving mid-twelfth century roofs. Working from the insight that these roofs were most likely visible from the rooms below, the thesis presents in-depth analysis of the sites, buildings, and their organisation of forms and volumes. The archaeological evidence is approached with architectural perspectives, and the study brings together a partly new view of the mid-twelfth century church architectures.

The five churches are part of a Swedish national heritage and they were, together with many other small churches in Sweden, extensively restored during the twentieth century. In this process, they lost some of their local diversity. As we now try to fit these monuments, which have a national identity, into an increasingly complex world with many identities, new understandings of the churches' varying pasts are important.



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