

Medieval Roof Trusses in Churches of Northern Småland

BY ROBIN GULLBRANDSSON

Abstract

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The preserved medieval roof trusses of eleven churches in northern Småland (the old folklands of Vedbo and Sevede) were surveyed in 2010. They span from Romanesque types to late medieval, Gothic types. Preserved early medieval roof trusses comprise a heritage of international importance, since few wooden constructions of such age are preserved outside Scandinavia. Nonetheless, no total survey of the Swedish material has ever been made, thus making it uncertain how many objects still exist in the church attics. An aim of the project was to test the potential of quick surveys as a means to get a picture of the number and character of preserved medieval roof trusses in one determined geographical area. Romanesque roof trusses are present or traced in six churches. The churches of Bredestad and Norra Solberga in Vedbo have intact crossed strut-beam roof trusses of a type represented in the landscapes around Lake Vättern during the 12th century. Later examples of this type were encountered in the churches of Mellby in Vedbo and Pelarne in Sevede. Above the naves of the churches in Bredestad and Bälaryd is another type of Romanesque truss, the collar-beam roof truss, in the later church with decorated steering plates, which have identical parallels in western Östergötland and Varend in Småland. A pair of roof structures (Marbäck and Vireda) represents the transition between Romanesque and Gothic structures. The fully developed Gothic roof structure is intact only in the churches of Askeryd and Säby, which were converted into hall churches in the Late Middle Ages. It is suggested that the Romanesque roof trusses are part of a regional tradition present in the landscapes around Vättern during the 12th and the beginning of the 13th century. *Robin Gullbrandsson, Jönköping County Museum, Box 2133, SE-550 02 Jönköping, Sweden. robin.gullbrandsson@jkpglm.se.*

Introduction

“It is now more clearly visible that in these roof structures the old domestic timber carpentry made its contribution to the Romanesque stone church, which otherwise was built according to imported models and methods” (Curman 1937, p. 194, translation by the author). In an article from 1937 concerning the Romanesque church roofs of Kumlabby on Visingsö and Garda on Gotland, the art histo-

rian and head of the National Board of Antiquities, Sigurd Curman, pointed out the unique corpus of preserved early medieval timber structures in the attics of Swedish churches. “A total survey thereof would perhaps give us greater opportunities to establish a better view of the timber carpentry which evolved and flourished in our country during the first millennia AD. [...] [the] task of studying preserved old roof trusses in Swedish churches [is] unusually rewarding. I hardly believe it a

mistake to claim that in our churches, compared to other countries, we have an unusually rich and interesting corpus of medieval roof trusses preserved, awaiting their methodical investigation” (Curman 1937, pp. 194 f., translation by the author). As Curman implied here, preserved timber structures from early medieval times are rare in an international perspective.

Scandinavia has a large number of highly authentic churches from the period 1100–1350, a fact to be partly explained by the political and economic history in subsequent centuries. Reference has often been made, for example, to “the importance of the Swedish poverty” and the absence of large-scale war damage (Lindgren 1995, p. 28). Among the early medieval churches in Scandinavia are 22 stave churches and nine timber churches (Ullén 1983; Lagerlöf 1985; Anker 2005; Linscott 2007, p. 4),¹ which constitute a well-known heritage. It is less well known that above the thousands of – whole or partly intact – stone churches of the period there is a considerable number of preserved roof structures (Sjömar 1992, p. 57; Sjömar 1995, p. 207; Linscott 2007, p. 4).² Curman regarded the Romanesque roof trusses as testimonies of highly developed domestic carpentry (Curman 1937; Ullén 1995, p. 47). The 53 medieval church roofs in Norway have been surveyed and classified by Ola Storsletten (2002), but in Sweden no national survey has ever been made. It has nevertheless been assumed that the Swedish material may consist of some hundred Romanesque roof structures and probably almost a hundred Gothic structures (Linscott 2007; Linscott & Thelin 2008).³ Since few geographically determined and methodical surveys of roof structures in medieval churches have been made up till now, our knowledge of the number of preserved objects is scarce and more or less random. In spite of this, it seems that the early medieval roof structures of churches in Götaland

may comprise the largest preserved corpus of this kind in Northern Europe (Linscott 2007, pp. 35 ff.). This heritage is about to attain its proper importance as a source for the dating of churches and for understanding the processes behind their erection.

Object

The object of this article is to present a survey made by Jönköping County Museum for the Diocese of Linköping in 2010. The aim of the survey was to obtain a complete view of preserved medieval roof structures in the Småland part of the diocese. The investigation was made on an overarching level, as a basis for future and more complete documentation with dendrochronological analysis. Another aim was to test a method for quick surveys of a large material, in order to pinpoint the extent of preserved roof trusses. The survey covered eleven churches which were known or supposed to have medieval roof structures (Fig. 1). Nine of these were in the hundreds (*härads*) of Northern and Southern Vedbo (the old folkland of Vedbo on the border to the province of Östergötland) and two in the hundreds of Sevede and Aspeland further to the east (also bordering on Östergötland). It could be stated that these churches have roof structures that belong in shape and craftsmanship to a period from the 12th/13th century up until the beginning of the 16th century.

This article seeks to contribute to the mapping of different types of medieval roof structures in the provinces of Götaland, where they are to be found and how they have developed. The results of the survey will be presented here and compared with what until now is known or supposed concerning medieval roof structures around Lake Vättern. The questions dealt with are the following. Which different types of roof trusses are represented in the area of survey? What can be stated about

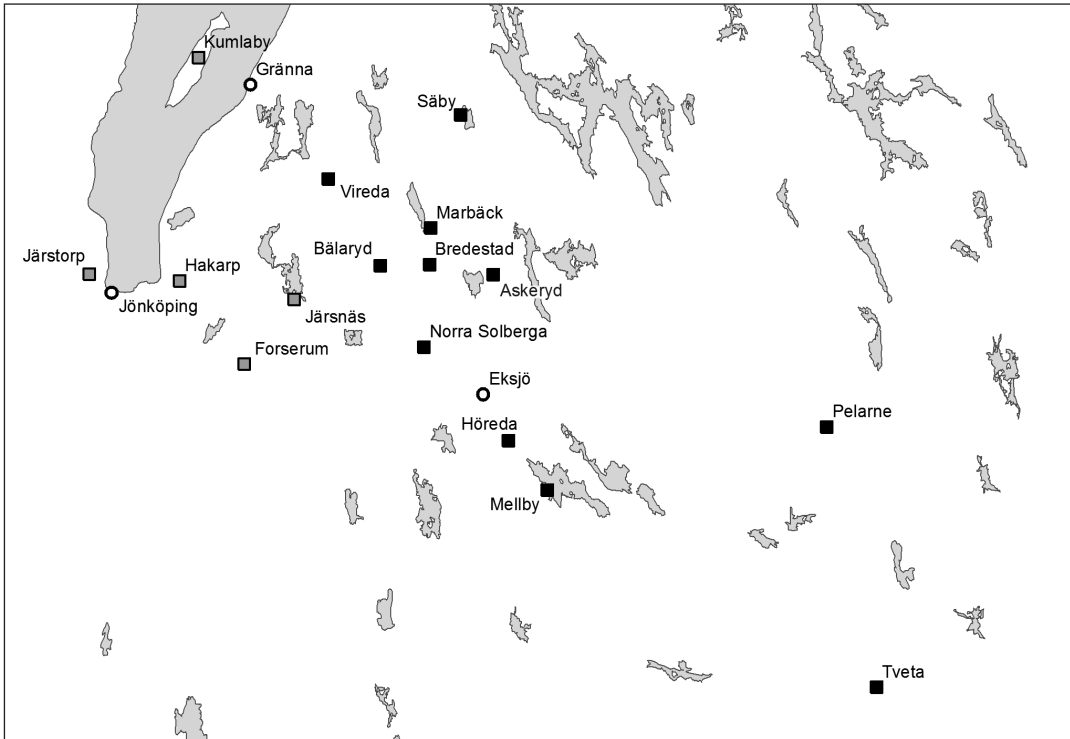


Fig. 1. Map of northern Småland with the churches of the survey marked in black, other churches mentioned in the article marked in grey. Map by Ingvar Røjder, Jönköping County Museum.

their belonging to different local or regional craft traditions? How are they spread in space and time? To what extent do they reflect changes in the spatial arrangement of the church interiors? A hypothesis is that the examined Romanesque roof trusses are more or less part of a coherent craft tradition that existed in the provinces around Vättern in the 12th and the first half of the 13th century. Another aim of the article is to present and evaluate the possibilities of a quick method for survey, enabling the mapping of a large body of material. This is an important task in order to create a foundation for research and to protect a heritage which easily could be damaged or destroyed out of ignorance, for example during a roof renovation.

Earlier research

The first attempts to interpret medieval roof trusses concerned some churches in Östergötland and were made by the art historian Otto Janse in 1902. He made observations that are still relevant, for instance concerning the lack of ceilings in the early Romanesque church interiors. The surveys made by the National Board of Antiquities in *Sveriges kyrkor* ("Churches of Sweden") during the 20th century brought new knowledge, but only studied a minor part of the total number of medieval churches. The approach to the roof structures was also quite limited, often consisting of just making a more or less schematic rendering of the type of truss in the drawn section of the church.

The art historian and architect Erik Lund-

berg took a vivid interest in timber architecture and presented quite daring conclusions concerning the origins and evolution of roof trusses, but on a scarcely recorded empirical foundation. He believed that the influences on the early medieval Scandinavian roof trusses came from the Continent, where the tradition from late classical antiquity could still be traced (Lundberg 1940, pp. 186–193; Lundberg 1949, pp. 128 f.; Lundberg 1971, pp. 31 ff., 40–48, 59–62, 202).

The emergence of dendrochronology in the 1970s and 1980s brought new interest to the medieval roof trusses as a means of scientific dating of buildings. Analyses were performed on samples from several churches in Gotland, Skåne, Småland, Västergötland and Östergötland by Thomas Bartholin, Alf Bråthen and Lars Löfstrand (Bråthen 1982; Gustafsson 1988; Sjömar 1992; Bråthen 1995; Eriksson 2006; *Braathen Dendrokronologiska Undersökningar*). With time the dendrochronological method has become widespread in archaeological practice, leading to a steadily increasing number of reference curves from different parts of Sweden and different sorts of wood. Much of this work is nowadays carried out by Hans Linderson at the Department of Geology, University of Lund. The oldest yet dated roof construction in Sweden belongs to the church of Herrestad outside Vadstena, erected around 1112 (Eriksson 2006, p. 43; Sjömar 1995, p. 207).

Beside the traditional perspectives of archaeology and art history, a new kind of approach is becoming established in the study of roof trusses and other timber structures from the Middle Age. This is a craftsman perspective and deals with questions concerning the process of construction. This perspective was introduced in Peter Sjömar's thesis from 1988, in which he investigated four medieval timber churches in Småland and Östergötland (Granhult, Pelarne, Tidensrum and Vireda). Sjömar was later to repeat the statement of Curman

cited above, aiming to enhance early medieval roof trusses as an unexplored field of research (Sjömar 1992 & 1995). The craftsman perspective has found its application in the investigations and practical experiments carried out by the craft school Da Capo, nowadays Hantverkslaboratoriet (www.craftlab.gu.se), linked to the Department of Conservation, University of Gothenburg, and the Södra Råda Project, the reconstruction of a burnt-down 14th-century timber church in Värmland (www.sodrarada.se). The constructions are viewed through the eyes of the carpenter, evaluating the processes of their creation.

With the creation of a database in 2007, the architect Kina Linscott, Department of Conservation, University of Gothenburg, and Staffan Nordin, Timmerdraget, set out to map the known medieval roof structures in Swedish churches, an enterprise commenced by Sjömar for the National Board of Antiquities in 1990 (Linscott 2007, p. 2). This emphasized the need for methodological national surveys, in order to create a basis for scientific studies and to safeguard the future preservation of the delicate material.

Method of the survey

The survey presented here was carried out by the author of this article, mainly during the autumn of 2010. Here follows an account of the method. Thanks to the characterizations made of all churches in the area during 2004–2007, the churches with potential medieval roof structures could easily be sorted out (Bebyggelseregistret; Nordanskog 2010). The first step was to excerpt the archives of Jönköping County Museum and Antikvarisk-topografiska arkivet (copies in the County Administrative Board of Jönköping) for the eleven churches in question. The purpose was to find information on renewals of roofs and damage by fire. The time

available for the fieldwork consisted of four hours per church. The main task in the attics was to make a sketch of the truss types represented, in some cases just one, in other cases more when there were several different attics or different types in one single roof structure (and thus more time-consuming, not least regarding the physical transportation from one place to another). The positions of the trusses and the wall plates were marked on existing older plans. The sketches were made on cross-ruled paper with angles and measurements noted and afterwards drawn fair in 1:50 and 1:100. The measuring equipment consisted of a folding rule and a laser beamer. A portable coated lamp was also used, which enabled taking photographs without flash as well as oblique lighting of details such as tool marks and numberings on the surfaces. Wood species, dimensions, cutting, traces of reuse or alteration were noted. The results were finally compiled in a report (Gullbrandsson 2011). To get a grasp of the extent and character of the preserved material in a region, the method proved well suited, though it cannot be compared with the accuracy of careful measuring. Due to the limited time some hard-to-get measurements had to be estimated and details have almost certainly been overlooked (especially because tie beams and other lower parts can be covered with insulation). But the goal of obtaining an overview, as a basis for proper management and further research, was achieved. Similar surveys are being made in the dioceses of Lund, Skara, Stockholm and Strängnäs during 2013–2014. This offers the possibility to refine the method in order to obtain comparable results, which can then be imported to the database. An example of deeper studies is the investigation that Linscott has undertaken during 2012–2013 regarding five of the oldest dated (the first half of the 12th century) roof trusses around Skara (not yet published).

Romanesque roof trusses

The Romanesque roof structure did not only have the practical function of supporting the roof, but was also an integral part of the church interior originally and thus an important element in the architectural and liturgical aesthetic. After the 13th century, the trusses were commonly hidden by flat wooden ceilings (Ullén 1995, p. 48; Bonnier 2008, p. 141). The survey encountered intact roof trusses of characteristic Romanesque types in the churches of Bredestad (the only apse church), Bälaryd, Norra Solberga, Pelarne (timber church) and rebuilt in the church of Tveta (Gullbrandsson 2013). None of these churches has yielded any dendrochronological results, although samples have previously been taken in Pelarne (Ullén 1983, p. 185). The angle of the roofs varies between 45 and 55 degrees and the material is usually pine and to a minor extent fir.

The most “classic” of the Romanesque roof trusses consists of tie beam, rafters and 2–6 interlacing strut beams, thus named a “crossed strut-beam roof truss” (Thelin 2006, pp. 52 f.). The trusses rest on heavy wall plates, which are embedded in the top of the masonry, facing outwards. This position of the wall plates connects them in time with the building of the walls. The trusses stand tight, sometimes hardly a metre apart, and they usually lack other longitudinal support than the boarding, in some cases attached to the rafters with long wooden pegs. The different parts of the truss are joined by straight overleafing with wrought iron nails or wooden pegs. Usually there are wooden pegs in the joints with the heavy tie beam, the most important load carrier, and nails in the others. Sometimes these pegs are shaped like nails, as can be seen in Norra Solberga, indicating the exclusiveness of the iron. The crossed strut-beam trusses are well represented in Västergötland and Östergötland in the 12th century and have been

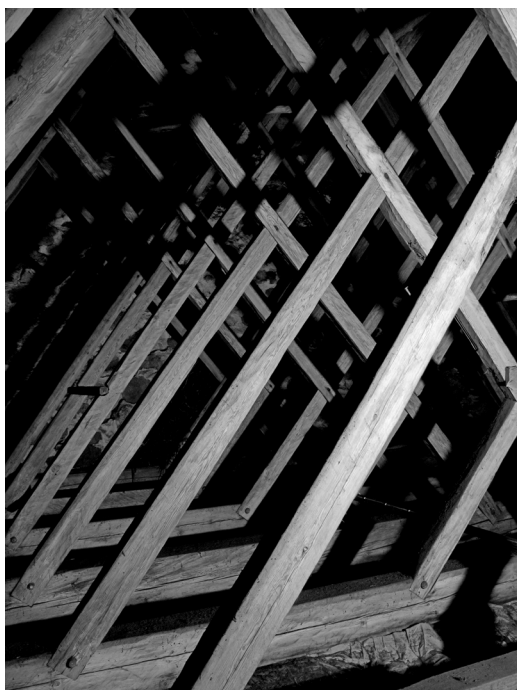


Fig. 2. The crossed strut-beam roof trusses above the nave of the old church in Norra Solberga. The joints with the tie beam have wooden pegs, whereas the others have wrought iron nails. Photo by R. Gullbrandsson.

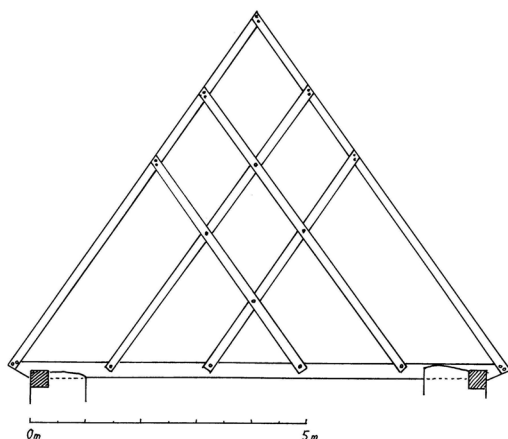


Fig. 3. Section of the roofing of the nave in Norra Solberga. Drawing by R. Gullbrandsson.



Fig. 4. Detail of tie beams above the chancel in Norra Solberga with wooden pegs shaped like nails. Photo by R. Gullbrandsson.

regarded as an early type of Romanesque roof truss (Linscott & Thelin 2008). In this survey they were found above the chancel of Bredestad church and above the nave and chancel in Norra Solberga old church (Figs. 2, 3 & 4), rebuilt above the nave of Tveta church.

Two other Romanesque types are represented above the nave of the churches of Bredestad and Bälaryd. These trusses consist of tie beam, rafters, collar beam and two strut beams, and can thus be sorted under the group of “collar-beam roof trusses” (Thelin 2006, pp. 52 f.). The collar beam is supposed to have been introduced during the 13th century (Sjömar 1995, pp. 210 f.; Linscott & Thelin 2008, p. 3) and this group is therefore regarded as younger than the crossed strut-beam trusses (Thelin 2006, pp. 52 f.). Is this an indication that the nave of Bredestad was erected later than the chancel? In Bredestad the collar beam is furnished with centred suspended beams (Figs. 5 & 6) which change place along a central axis (a steering beam) from truss to truss. Collar-beam roof trusses with this trait can also be seen in the church

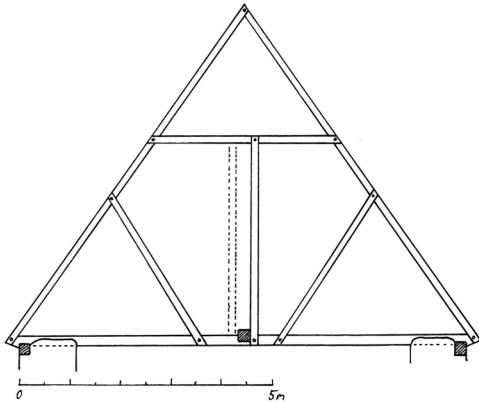


Fig. 5. Section of the roofing above the nave in Bredestad. A collar-beam roof truss with suspended beam, which shift position from side to side of a centred steering beam. Drawing by R. Gullbrandsson.



Fig. 6. The roof trusses above the nave in Bredestad. Notice the *sprättäljning* on the suspended beams, apparent in the oblique lightning. Photo by R. Gullbrandsson.

of Drev (dated to 1170) outside Växjö, in the old folkland of Varend.

Distinctive in Bälaryd are the two crossed strut beams above the collar beam (Fig. 7). This type of truss is almost identical with the one above Dädesjö church, not far from Drev. What is particularly interesting in the roof structure of Bälaryd is the presence of three decorated steering plates and one remaining piece of ridge purlin (Fig. 8). This practical and decorative concept can be found in Småland in the above-mentioned churches of Drev and Dädesjö, Jät church (dated to 1226; Thelin, *Historic Roof Structures*), also in Varend, and Forserum outside Jönköping. In western Östergötland it is present in the churches of Furingstad and Hagebyhöga (dated to the 1120s, Fig. 9). The same type of ridge purlin can be found in the church of Herrestad – where dendrochronology and marks show that it was reused from a 10th-century stave church (Eriksson 2006, pp. 7 & 43; the same might be the case in Flistad in Västergötland according to Eriksson 2006, p. 31) – and Väversunda (dated to 1158), both in western Östergötland, as well as in Kinne-Vedum (dated to 1188) in Västergötland.

The present chancel in Bälaryd was supposedly erected during the 13th or 14th century, with the same width and height as the nave. Until then there could not have been any inner ceiling. The trusses were created to be visible from below. Whereas the trusses of the new chancel are much simpler, this must have meant the creation of an inner ceiling to conceal the differing types of trusses. A dendrochronological analysis of the different trusses would surely be a rewarding way to pin down the introduction of the inner ceiling. What is also of interest in Bälaryd is the presence of the L-profiled truss of the old eastern gable of the nave, with decorated though simple furnishing and marks from a lost ridge decoration or ridge cap (Fig. 10, compare Lundberg's reconstruction of the gable peak

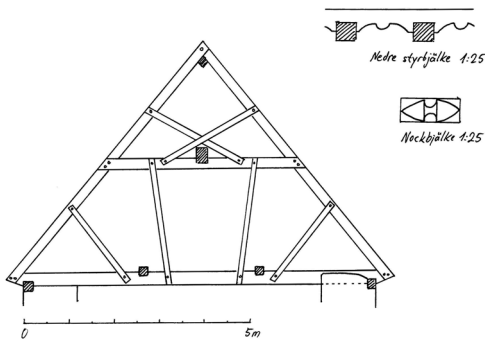


Fig. 7. Section of the roofing above the nave of Bälaryd with three decorated steering plates and ridge purlin. Drawing by R. Gullbrandsson.

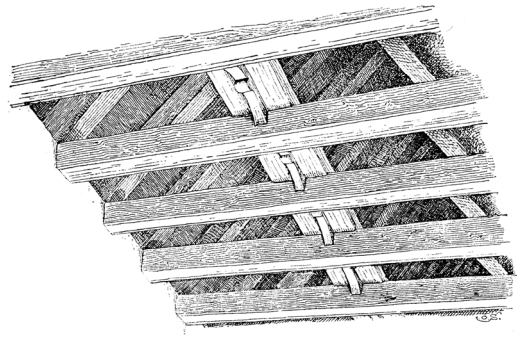


Fig. 8. Decorated steering plate and ridge purlin in Bälaryd. Photo by R. Gullbrandsson.

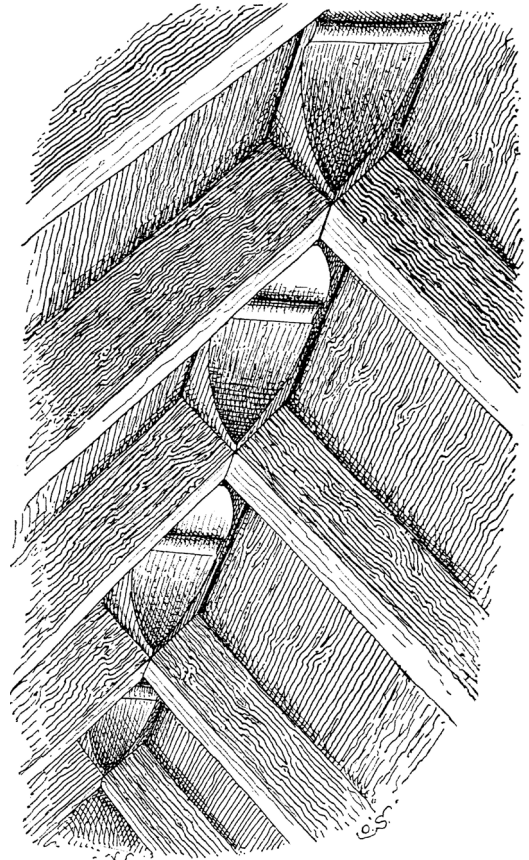


Fig. 9. Reconstruction of the roofing in the church of Hagebyhöga in Östergötland with decorated steering plate and ridge purlin. From Janse (1902).

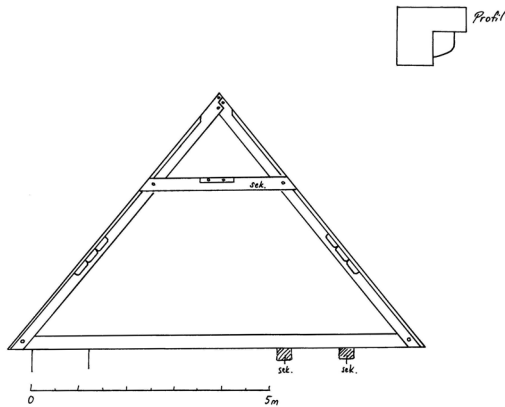


Fig. 10. The former east gable truss of the nave in Bälaryd with simple decoration and trace of a ridge decoration. The collar beam is secondary. Drawing by R. Gullbrandsson.



Fig. 11. Carpenter Mattias Hallgren, Traditionsbärarna, cutting boarding for the reconstruction of Södra Råda church, using the technique of *sprättäljning*. Photo by R. Gullbrandsson.

of Väversunda church in Lundberg 1971, p. 45). Above the timber church of Pelarne in the hundred of Sevede there is a simple version of collar-beam roof trusses consisting of tie beam, rafters, collar beam and two strut beams. Traces of painted decoration in the interior indicate that the church was erected before 1350 (Ullén 1983, p. 185).

A trace that all of these Romanesque trusses have in common is the technique of cutting. All elements are carefully cut to square angles with a special axe and technique, known as *sprättäljning*, leaving unmistakable traces, a type of fishbone pattern leaping in even bands along the whole piece (Fig. 11). Sometimes, for example in Pelarne, this pattern has vanished since the surface was planed with a draw-knife or *skave*. Hewing by *sprättäljning* has come to be regarded as a characteristic of early medieval timbering in Scandinavia (Sjömar 1988; Storsletten 2002; Linscott 2007; Linscott & Thelin 2008; Melin 2008). Sometime during the 14th century, however, it vanished and was replaced with a cruder technique, hard to distinguish from works of early modern times, thus making the pure stylistic dating of Gothic and Renaissance structures problematic. It has also been argued that *sprättäljning* could have been a prehistoric Nordic technique applied to the new churches, considering the fact that the techniques of handling the timber did not change from the earliest preserved objects up until around mid 14th century (Storsletten 2002).

Possible traces of the mounting of liturgical bells were noticed in two tie beams above the chancel in Norra Solberga and as small separate wooden arms above the chancels of Mellby (vertical on a tie beam) and Vireda (on a rafter foot). In Norra Solberga, any bells in such a position must have been visible from below, as is the case in the church of Kumlabby on Visingsö. In the other cases the bells could have functioned even with a separating ceiling.

Reuse of older roof trusses has been observed in some churches. When the medieval church of Tveta in the hundred of Aspeland was given a new vaulted ceiling during a neo-classical renovation, the old Romanesque crossed strut-beam trusses were remodelled using the old parts, thus allowing us to get an idea of the original construction. In building the 17th-century stone church of Hakarp, not far east of Jönköping, the parish took advantage of the material from a former medieval timber church (probably dating from the end of the 13th century, see Gullbrandsson 2012). The old trusses were reused and still bear traces of the former jointing (survey by Gullbrandsson & Traditionsbärarna 2012–2013). This means that older parts can be found in rebuilt roof structures, which enables us to reconstruct a probably original form (Sjömar 1995, p. 212). In the church of Järstorp, west of Jönköping, the presence of a reused Romanesque rafter allowed Sjömar to reconstruct a truss with crossed strut beams (Sjömar 1992, pp. 60 ff.).

As a summary it can be stated that there are three different types of Romanesque roof trusses represented in the survey area. The type with crossed strut beams is present in Bredestad (chancel), Norra Solberga, and altered in Tveta (nave). At least in Norra Solberga, traces of paint and a possible mounting for bells indicate that the trusses originally were visible in the church interior. The two other types, with collar beams, can be found in Bredestad (nave), Bälaryd and Pelarne. In the case of Bälaryd the trusses above the nave have decorated steering plates and part of a ridge purlin (of a kind represented in other parts of Småland as well as in Östergötland), whereas the later added chancel has simpler trusses. This illustrates well the shift from visible to hidden roof structures during the 13th century. These Romanesque roof trusses all bear the characteristic marks of *sprättäljning*.

Gothic and early Renaissance roof trusses

Gothic church construction brought about the differentiation and interaction between the roof trusses as well as the introduction of the rafter foot. This was made to divide the weight of the roof construction more evenly on to the walls, thus enabling larger wall openings and the vaulting of the church interiors. In the Romanesque structures each truss usually works on its own and there are few or no differences in shape. The joints in the Gothic trusses are more advanced than the Romanesque ones. We now find joints with notched laps, preventing withdrawal. Many of the joints are marked with carved numbering in the form of flags, lines or Roman numbers.

The consistent Gothic structures are few in the area of survey. Only two are completely preserved. The most imposing Gothic roofing is to be found in Säby, the largest of the preserved medieval churches in the area (Fig. 12). There are 34 trusses with an angle of 60 degrees and a span of almost 10 metres (almost the same in height). Here we find the types of trusses developed to coexist with a vaulted church room. They consist of rafter feet, double wall plates on top of the masonry, collar beam and scissor beams. In between every vault there is a truss with tie beam. All parts are marked with Roman numbers, indicating that the parts were completed and matched to another on the ground and then put together on top of the church according to the markings (compare Hallgren *et al.* 2013). This probably took place when the church was enlarged into a vaulted hall church in the 15th century. An enlargement to the east of Tveta church has remains of altered Gothic trusses.

Askeryd church boasts the only completely intact construction with longitudinal beams and king posts (Figs. 13 & 14). All parts are numbered carefully, with different systems for

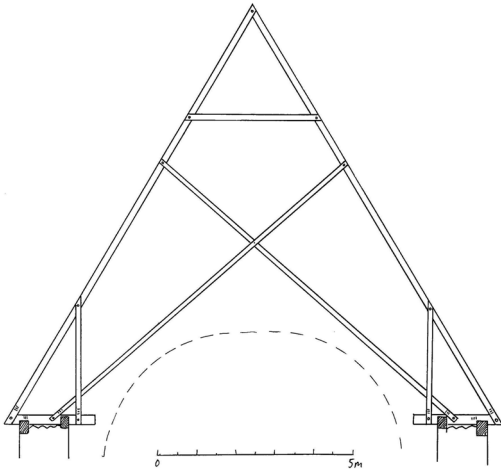


Fig. 12. Section of the Gothic roofing in Säby with characteristic rafter feet and scissor beams. Each part in the rafter foot was numbered before assembly. Drawing by R. Gullbrandsson.

north versus south (carved flags and lines). With the introduction of longitudinal supportive systems during the 13th century – for example, in France – the Gothic trusses and their hierarchy developed further, to reach a peak during the late medieval period, at which time the system got common in Scandinavia (*Kulturbistoriskt lexikon XVIII* 1974, pp. 68 ff.; Hoffsummer *et al.* 2011). The dating of Askeryd can be connected with the creation of a hall church in the 15th century. We also find trusses with longitudinal beams and king posts, though smaller in scale, above what seems to be a never-completed west tower for the church of Höreda. The church burned around 1400 and/or during the Danish campaign of 1520–1521 (Törnvall 1996; Ödeén 2008), and thus it could be argued that the construction belongs to the 15th or 16th century. A single truss from a similar construction has been noticed by the author above the old chancel of Järnsås church.

In summary it can be stated that strictly Gothic roof trusses in the survey area only exist in the churches of Askeryd, Höreda and

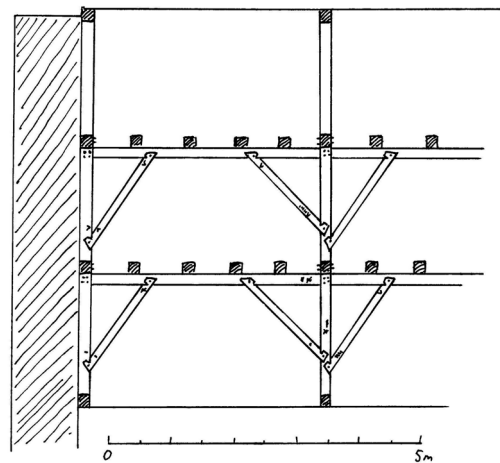
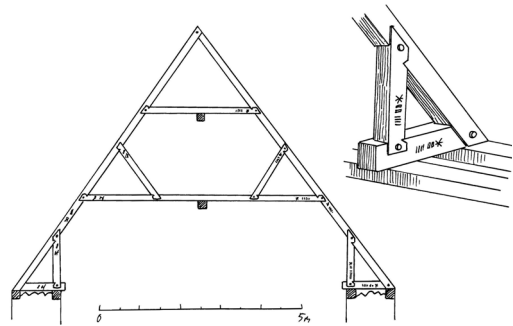
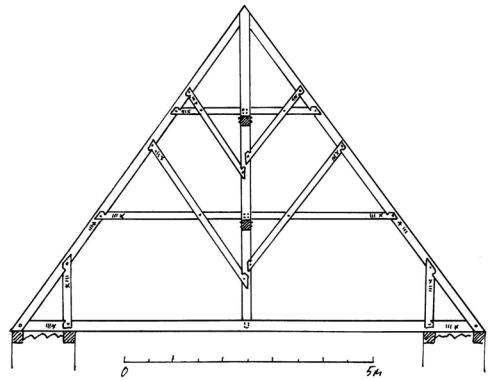


Fig. 13. Sections of the late Gothic roofing in Askeryd with longitudinal beams and king posts. A rare phenomena in medieval Götaland? Every part in the construction is numbered, with separate systems for north and south. All joints are notched. Drawings by R. Gullbrandsson.



Fig. 14. Detail of the roofing in Askeryd with the lower part of two king posts. Photo by R. Gullbrandsson.

Säby. They represent the evolved hierarchy in trusses, created to enable a vaulted church interior. Consistent markings reflect a different process in erecting roofs than was the case with the Romanesque churches. The structures in Askeryd and Höreda have longitudinal beams and king posts that make the roof structure into an entity with all the parts cooperating, thus representing the final stage of the Gothic system.

Transitional forms

The trusses of Marbäck church and the timber church of Vireda are interesting as transitional forms between Romanesque and Gothic. None of them have any obvious *sprättälj-*

ning and both have numbering. Marbäck has many characteristics of the Gothic trusses: double wall plates, scissor beams and collar beam, but no strut beams between rafter and tie beam (Fig. 15). Probably the trusses of Marbäck can be linked to the extension of the church and the building of a new chancel of the same width as the nave during the second half of the 13th century. When the interior was vaulted during the Late Middle Ages some of the tie beams were cut, without rafter feet being inserted, and this weakened the construction. The form in Vireda is almost Romanesque, with “collar-beam roof trusses” (double collar beams and two strut beams). Shingles on the old chancel gable have been dated to 1344 (Ullén 1983, p. 134). The trusses above the hall church of Mellby are also

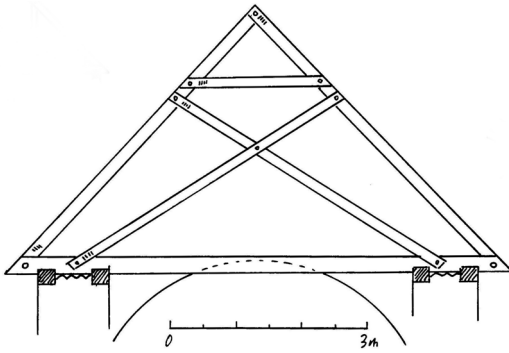


Fig. 15. Section of the roofing in Marbäck. A merger of Romanesque and Gothic traits. The tie beam is still in use but instead of strut beams we find scissor beams and the double wall plates, which are usually connected with rafter feet. Each part is numbered. Drawing by R. Gullbrandsson.

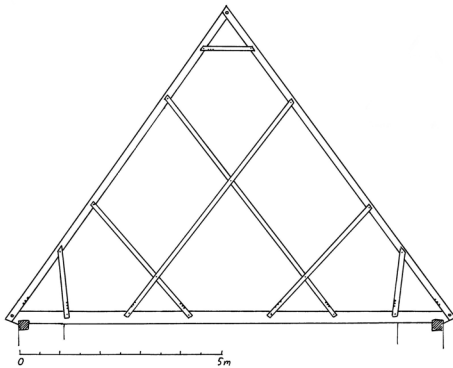


Fig. 16. Section of the roofing in Mellby. The trusses are Romanesque in shape but date to the end of the 13th and the beginning of the 14th centuries, probably going back to an older roof. Drawing by R. Gullbrandsson.

Romanesque in shape (Fig. 16). Some parts are clearly hewn by *sprättäljning* and there are two different systems of numbering, discretely carved marks on the edges versus simple lines. Dendrochronological analysis indicates that the roof structure was rebuilt in part or whole in the middle of the 14th century with re-used trusses, half a century older. The

southern wall plate and a tie beam gave a dating to the 12th century, thus indicating an even older structure (Linderson 2010), maybe from an original wooden church (Ullén 2006, p. 74). Whether or not the flat wooden ceiling is medieval has not been investigated.

The roof trusses of the churches in Marbäck, Mellby and Vireda cannot be classified as strictly Romanesque or Gothic; they bear traits of both systems and should be regarded as transitional forms belonging to the 13th and 14th centuries. In order to put these roof structures in context, further surveys are needed in adjoining areas.

Discussion

The lack of complete surveys from Götaland, and the fact that a large number of churches have been torn down or rebuilt, limits the conclusions that can be drawn. Today we can only see a fraction of how widespread different types of roof trusses were in time and space. Nonetheless, an attempt is made here to sketch what can be stated about the surveyed roof structures from the present standpoint. The Romanesque crossed strut-beam trusses can be found in large parts of medieval Götaland. This type could be regarded as the most common of the early medieval ones. Some examples may be mentioned: in Småland the church of Forserum (the only Swedish church where the Romanesque trusses today are visible from the interior, due to the restoration by Erik Lundberg in 1935, Fig. 17), the timber church of Granhult (dated to 1217), Hemmesjö old church (dated to 1200) and the old church of Jät (dated to 1226); in Västergötland the churches of Forsby (dated to 1135), Gökhem (dated to *c.* 1130), Kinne-Vedum (dated to 1188) and Marka (dated to 1125); in Östergötland the church of Väversunda (dated to 1158). We can clearly state that this type of trusses were built in the

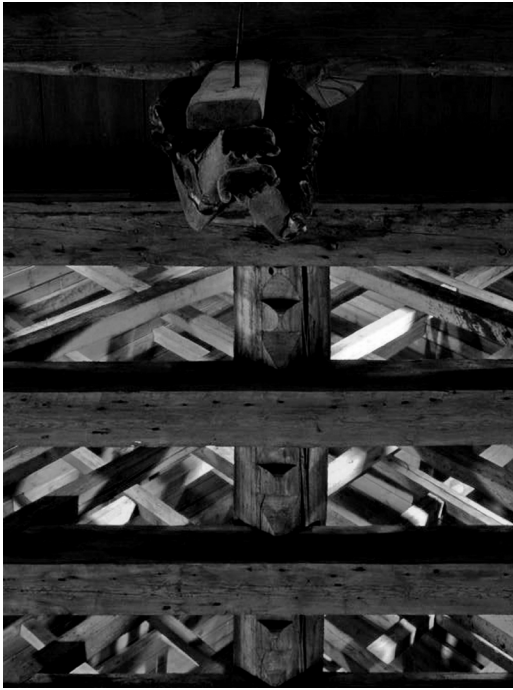


Fig. 17. The crossed strut-beam roof trusses above the nave in Forserum; since the architect Erik Lundberg's restoration in 1935 they are again visible in the church interior. Notice the decorated steering plate. Photo by R. Gullbrandsson.

provinces around Vättern during the whole of the 12th century. Among the now surveyed churches of northern Småland we find that the crossed strut-beam trusses also appears as late as the end of the 13th century and the mid 14th century in the church of Mellby, but with collar beam. The Romanesque form seems to have lived on for a long time in some parts of Götaland, sometimes merged with the new Gothic forms. Can this be explained by the long distance from the existing economic, political and religious centres around Vättern?

The Romanesque trusses of the naves in Bälaryd and Bredestad seem rare. The group of collar-beam trusses is substantial, but these two have traits with few known correspondences in Götaland. What is interesting is

the little upper cross of strut beams in Bälaryd and Dädesjö and the suspended beam between tie and collar beam in Bredestad and Drev. According to Lundberg, the suspended beam was a means of reducing the pressure on the tie beam, a trait of the late Roman roof trusses (Lundberg 1971, p. 31). The crossed struts above the collar beam, as well as the centred suspended beam, can be encountered in the church of Saint-Loup-sur-Cher in France, dated to around 1200 (Hoffsummer *et al.* 2011, p. 98). Surely these traits were no local invention and maybe they once were more common. Identically decorated steering plates and/or ridge purlins can be found in Småland and on both sides of lake Vättern.

In the surveyed area and its surroundings it is hard to claim any clearly local traditions in the craftsmanship concerning Romanesque roof trusses. The diversity of shapes represented by the objects of this survey reflects differing traditions of form. But in comparison with the known objects in Västergötland and Östergötland, a regional continuity of different shapes can be seen around Vättern, the geographical centre of medieval Götaland. Sjömar recognizes the existence of several different "carpenter traditions" in Scandinavia (Sjömar 1988, p. 16). Is there a tradition or traditions that were typical of the provinces around Vättern? With complete surveys of preserved Romanesque roof trusses in all the provinces of medieval Götaland, a foundation could be laid to discuss questions concerning the emergence and spread in space and time of the different types of trusses. This could also help explain why we find Romanesque shapes as late as the 14th century in the trusses of Mellby and Pelarne.

The technique of cutting is a thing in common to most of Scandinavia during Early Middle Ages. The question of whether this technique goes back to prehistoric times has until now been left unanswered. Did local timber craftsmen merge with the imported

masons in the early building of Romanesque stone churches during the 12th century? It has been claimed that the use of roof trusses was an early medieval introduction in Scandinavia, a framework enabling the roof structure to span a broad space without other support than the outer walls (Lundberg 1971, pp. 40 f., 61; Andersson 2007, p. 6). Lundberg suggested that the early Romanesque roof trusses, the strut-beam and the crossed strut-beam types, were an import to Scandinavia, and that the local carpenters in the beginning did not fully understand the distribution of loads. He exemplified with a reconstruction of the 11th-century trusses of Saint-Germain-des-Prés in Paris with strut beams and suspended centred beam. The crucial suspended beam is lacking in the early Swedish trusses, such as Herrestad and Hagebyhöga, thus making it necessary to make the tie beam thicker in order to carry the load (Lundberg 1949, p. 128; Lundberg 1971, pp. 40 f., 61, 202). A preserved parallel to the Swedish crossed strut-beam truss is to be found above the northern transept of the church of Saint-Christophe (11th or 12th century) in Chabris in France (Hoffsummer *et al.* 2011, p. 88), which also exemplifies that this type was no Scandinavian invention. According to Lundberg, the strut-beam roof truss and the crossed strut-beam truss during the course of the 12th century were inherited by “local schools”, which sometimes merged different forms and motifs (Lundberg 1940, pp. 188–193; Lundberg 1971, p. 61). It is plausible that the main elements of the early Romanesque roof trusses were introduced from abroad. But the scarcity of preserved early medieval roof trusses in Europe is a difficulty (Linscott & Thelin 2008, p. 6; Hoffsummer *et al.* 2011) and it would go beyond the aim of this article to further discuss the question here.

That the early Romanesque roof trusses were a visible part of the church interior is now regarded as a fact (Sjömar 1992, p. 66;

Ullén 1995, p. 48 f.; Bonnier 2008, p. 141). Clear indications of this can be found in two of the investigated churches. The decorated trusses of the old nave in Bälaryd and the younger undecorated ones of the new adjoined chancel in the same church indicate this. The remains of limewash on trusses of Norra Solberga church also emphasize this. The observation of limewashed trusses was first made by Andreas Lindblom in Knista church in Närke (Lindblom 1910, pp. 190 f.). Traces of paint on trusses should be considered in coming surveys. Other phenomena marking the absence of ceilings are traces of the mounting of liturgical bells in the tie beams, which can be noticed above the chancel in Norra Solberga. The transition from open roof structures to flat wooden ceilings seems to have taken place during the 13th century as indicated, for example, in Bälaryd, Dädesjö and Hagebyhöga (Sjömar 1995, p. 226; Ullén 1995, p. 49).

With the Gothic renewal of some of the surveyed churches from the late 13th century up until the beginning of the 16th century – concerning new larger chancels and vaulting – completely new trusses were created. Whereas Gothic renewal was scarce in the rest of Småland, this area was obviously influenced by the proximity to Östergötland and the construction activity there (Ullén 2006, p. 73). The early examples, such as Marbäck, shows both Romanesque and Gothic traits, in fact being rather Romanesque in function. Only from the Late Middle Ages do we find completely Gothic trusses in the area, with a pronounced hierarchy and interaction between the separate trusses. The concept of longitudinal beams and king posts seems to have been introduced here around 1500. This type of construction was until recently regarded as mainly a Continental and south Scandinavian phenomena (Thelin 2006, p. 54). Consistent timber marking shows that the different parts were finished on the ground and mounted one by

one above the church. Romanesque trusses usually lack markings, though they are to be found in the trusses of Mellby (the same in Stenberga in Småland according to Andersson 2007, p. 31, the church dated to 1332) and Vireda. On a truss above the nave of Norra Solberga the runes "I þ" are found, although their meaning is unclear. Observations made by the carpenters connected to the Södra Råda project indicate that the parts of the Romanesque truss were assembled on the ground and mounted on the church walls as one piece (Andersson 2007, pp. 27 & 38). The introduction of numbering marks a change in the process of erecting church roofs. With Gothic and later trusses the different parts were joined first on top of the church, thus the need for a marking system.

The surveys to come will certainly enlarge the empirical material considerably, giving us a more complete picture of what has been preserved in the church attics. This will enable the modification of the present questions and form the basis for new ones. Further studies in specific roof structures, in combination with dendrochronological analysis, will yield important data for creating a typology and a chronology for the Swedish material. In the end, better knowledge may contribute to the preservation of a unique but long neglected heritage.

Notes

- 1 The preserved Scandinavian timber churches from 1100–1350 are all in Sweden: Granhult, Hammarö, Haurida, Jällby (dendrochronological analysis in progress), Pelarne, Stenberga, Tidersrum, Tängeråsa and Vireda. The timber churches of Brämhult and Älgårås are dated to the 15th century (Lagerlöf 1985; Ullén 1983).
- 2 In total there are 438 preserved and 821 partly preserved medieval churches in Sweden (Sockenkyrkorna 2008).
- 3 The grouping of roof trusses in Romanesque and Gothic constructions was used by Danish

architect Elna Møller and has been acknowledged by later research. The grouping is made from a construction perspective and is not to be understood as a strict chronological one. Romanesque types of trusses can be observed even in Late Middle Ages (Møller 1953; Sjömar 1995 pp. 207 f.).

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