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Medieval church roof constructions in North Schleswig and Southwestern Jutland – examples of tradition and innovation

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Only few of the Danish medieval parish churches can be dated. This paper presents an attempt of doing so by the help of dendrochronology of a number of church roofs of different types. Results show this is possible although only in cases where original roofs are preserved in a sufficient degree. The typology of church roof constructions has been revisited and so has the general dating of types and their origins.

Keywords: church roofs; dendrochronology; dating; innovation; timber construction

This paper presents an attempt to date, by means of dendrochronology, some of the very well preserved, medieval church roofs of Southwestern Jutland and North Schleswig (Figure 1). One of the main theses of the project was that dating the roofs should also establish datings of the time of the erection of the investigated church and its building materials. This in turn could establish a somewhat more reliable basis for the dating of the occurrence of building materials such as tufa stones and bricks in the town deposits in the city of Ribe (Madsen 1993, 1994, 2007, cf. 2005a, 2005b).[1]

Although the interest taken by Danish scholars in medieval roofs had an early start at the end of the nineteenth century, represented by amongst others the Director of the Prehistory Department of the National Museum, Dr. Sophus Müller (Figure 2), the general conclusion was that most timber constructions in the medieval parish churches were the result of post-medieval rebuilding and repairs (Müller 1887, Storck 1890, Koch 1899, Schultz 1940). This view was finally changed when Elna Møller published her initial study of church roofs in South West Jutland and North Schleswig in 1953. She convincingly proved that roofs from the Middle Ages were far from an exception and that quite a lot of them seemed to be original and perfectly preserved constructions from the time of the erection of the church (Figure 3). In this first attempt to date and typologize Danish medieval church roofs, Møller emphasized the importance of timber numbers and numbering as indicators of medieval carpentry practice (cf. Moltke 1953, Møller 1953, 1963).

At the beginning of the 1950s of course no dendrochronology could be applied to her investigation and her terms and tentative datings had to remain unsupported until this method was taken into account by a new project in 1986. The initiative to combine Møller's investigating with dendrochronology was taken by Elna Møller, Hans Stiesdal and myself as a collaboration project between the National Museum and the Museum of Ribe, Den antikvariske Samling. Dendrochronological analysis were carried out by Wormianum or by NNU, the National Museum's Department of Natural Sciences.[2]

The first phase of the investigation was a series of limited dendrochronological samplings in fourteen selected village churches which, as far as roofing is concerned, were considered to be among the most interesting and best preserved in the country, while at the same time offering the potential for finding answers to the general questions posed by the project. Later on, more churches were added as part of the work of the Danish church inventory, Danmarks Kirker, forming an initial total of 23 church roofs (Figure 4). They are distributed fairly evenly over the Southwestern and Southern Jutland and North Schleswig region, with a certain concentration in the vicinity of Ribe, but on the whole corresponding in size, materials and architecture to the overall distribution of the village churches of the area.

The consistent use of timber numbers and the numbering of individual pieces of timber in order to indicate the proper placing of trusses and timbers formed the basis for analysing the roof constructions (Figure 5). The point of departure was the hypothesis that consistent, intact numbering would document the composition of the roof constructions in question. This hypothesis was confirmed, although this does not necessarily mean that every such roof construction dates from the time when the church was

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Figure 1. Map of Medieval Denmark and the Duchies of Schleswig and Holstein, the physical position of Ribe being within the boundary of Schleswig. In the Late Middle Ages the city became a part of the Kingdom of Denmark. Drawing: Merete Rude.

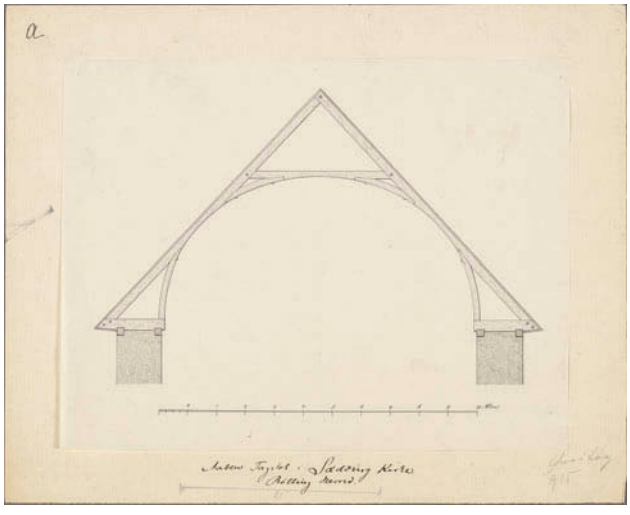


Figure 2. Roof construction above the eastern part of the nave in Sædding Church. After Müller (1887).

built and thus enables us to use dendrochronological analysis to date the building of the church accurately. The numbering systems observed were all applied by carving, chopping or scratching in the wood; no numbers made with either paint or chalk were observed, and in all cases they served to identify the position of the trusses in a predetermined sequence. Usually the number was applied to several or all of the timbers in the trusses, since the builders chose to combine the numbering with an indication of where and how the individual pieces were to fit together in the trusses. What we have is thus a combination of timber fitting marks and sequential numbering of the bays, a procedure that may turn out to have been characteristic of both the investigated roof constructions and their counterparts elsewhere in the country. The practice in the numbering area seems to correspond best to what we know from Germany, a similarity that cannot come as any surprise in the Southwestern Jutland and North Schleswig area, and which emphasizes that these regions should hardly be viewed as a relict area. On the contrary, the question must at present remain open whether, unlike here and the rest of Denmark, timber numbering can never, or can only later in the Middle Ages, be demonstrated in Finnish, Norwegian and Swedish church roofs (Hiekkanen 1989, 1995, p. 261, Binding 1991, p. 14 and 63, Sjömar 1992, 1995, p. 210/fig. 4, p. 212/fig. 7.l, Storsletten 1993, 1995, p. 153, 2002, Fischer-Kohnert 1999, p. 7 and 29).

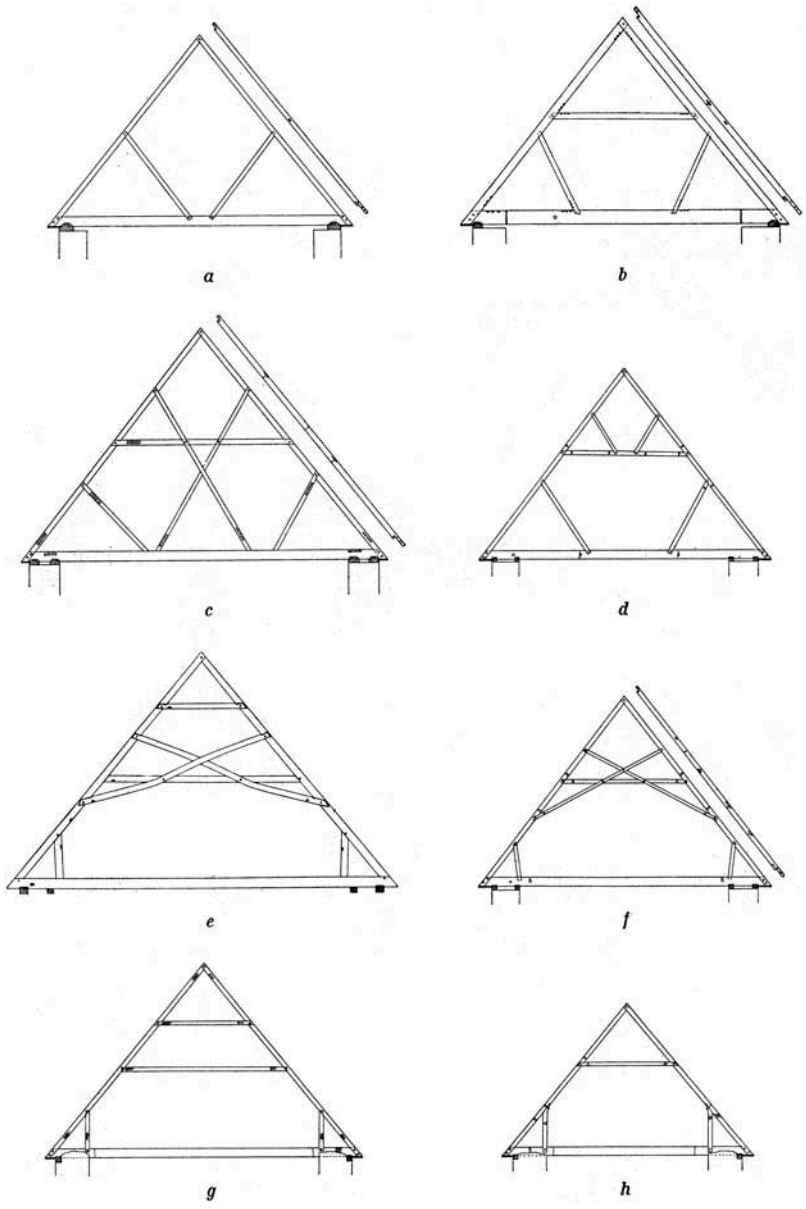


Figure 3. Elna Møller's classification of truss types from her paper in 1953. After Møller (1953).

From the outset, the investigation concentrated on the roofs over chancel and nave, since at first it was considered that the apse roofs offered limited potential. In general the project gave the highest priority to shedding light on the building date of the churches and their oldest construction history (Figure 6). Roof constructions in annexes to the churches were not included, not even for the possibility of demonstrating recycled timbers, something that was however investigated in the roofing of the oldest parts of the buildings, but without success. At first the sampling concentrated on the largest timbers with most growth rings, which were expected to produce the best results. As the work progressed, the smaller apse roofs also proved fruitful, and other pieces of timber could be included. This applies for example to the rafters, which unlike the tie beams and despite their often rather few growth rings may have preserved both the youngest growth rings and even the bark of the tree.

The project has produced several surprises in cases where roof constructions which were assumed to be contemporary with the erection of the church in question, and which had given their names to accepted type classifications, ended up being far younger than expected. This is

Figure 4. The 23 primarily investigated churches in Southwestern Jutland and North Schleswig. Drawing: Merete Rude.

the case with the church in Arrild some 15 kilometres south east of Ribe (Figures 4 and 7) (Danmarks Kirker 1953, p. 1264, cf. Danmarks Kirker 1963, p. 2700).[3] Elna Møller once called the truss type in the nave, with its two pairs of long struts, the Arrild type (cf. Figures 3c and 8). At the same time she considered this and a related type called after Arrild's neighbouring church Roager to be the oldest truss types exhibited by the churches of the area. However, it has been established that the timber in the roof structure of the nave of Arrild was felled in 1354 – but it should be noted that this was a renovated roof, which had replaced the original one of the same type after a fire. The Roager type too has turned out to have a considerably longer history than was thought, so we must assume that these types represent longer-standing regional features rather than chronological features alone and that they should not be considered as chronologically significant for any larger regions.

In the case of some of the churches where one could reasonably speak of contemporaneity of the building of the church with the preserved roof construction, a later construction date has been identified than traditionally suggested. In this respect the comparison is to some extent unfair, since the dating of churches in Denmark has almost exclusively had to be based on the wider framework of style-historical analyses, and in the present investigation we only have a geographically and otherwise limited segment of a very large body of material. When it comes to the building of stone churches in the western part of North Schleswig and in Southwestern Jutland, the transition between the almost unknown wooden churches and the standing stone churches, as proposed by Elna Møller, must have been relatively late – that is, in the period between c. 1200 and 1250/75 (Møller in Danmarks Kirker 1963, p. 2657, Møller 1979). This applies not only to the

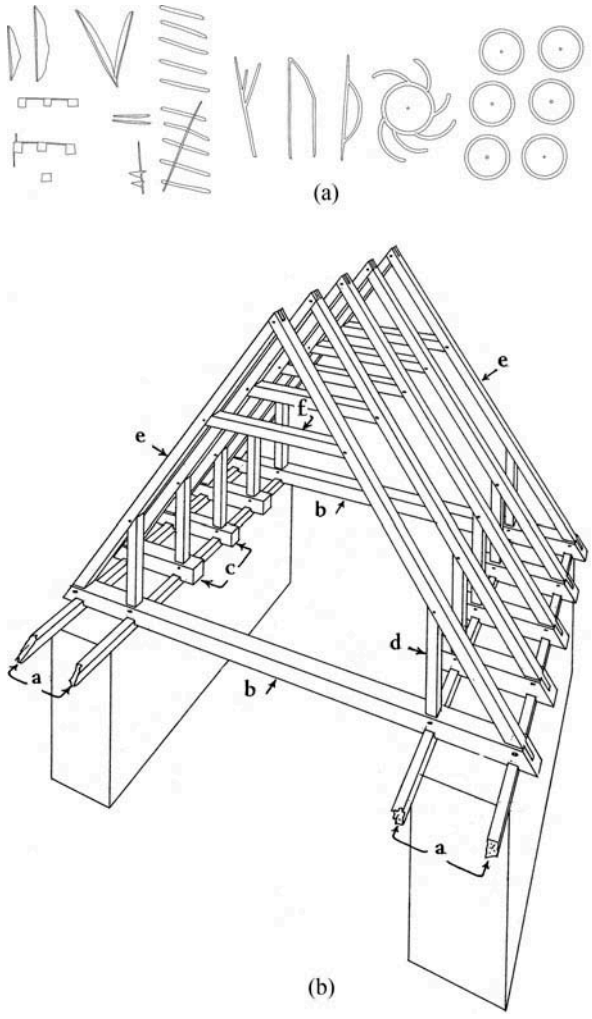


Figure 5. a. Timber numbers of various types, made with an axe, with a chisel or a knife. b. Designations for the most common parts of a medieval church roof structure. It consists on this drawing of five trusses on a set of double wall plates on each crown. a: wall plate. b: tie beam. c: truss – cut-off end of tie beam. d: vertical struts. e: rafter. f: collar beam. After Danmarks Kirker (1998–2000, p. 47).

stoneless areas to the far west, where imported calcareous tufa and brick may have been in use almost at the same time. Indirectly it emphasizes the unbroken importance of building in wood well into the Middle Ages which is also testified by other sources.

If the conclusion must be drawn with caution this is also due to the reservations attendant on the attempt to establish and especially to date the four different main types of truss: the Roager type, the Arrild type, the crossbeam type and the collar-beam type with which Elna Møller operated in the area investigated (Figure 3). The types can still be distinguished, but rather than a general development we may be dealing with regional preferences, and perhaps in the case of the Roager and Arrild types, of a relict-like character. As a partly alternative supplement attention has been drawn to the appearance of interior, short struts in the individual types (Figure 8). These struts and the rigidity in which they lock the truss, are seen as a crucial feature of the development in terms of controlling the stress exerted by the roof on the roof construction, and which the short struts help to propagate down into the core of the stone walls. For obvious reasons no parallels to this can be observed in timber architecture where only thin wall constructions appear. The use of the interior short struts should maybe be viewed in the context of the development of building with stone in medieval Denmark as it seems rather difficult to point out inspiration for this particular feature outside Denmark from before the time around and after c.

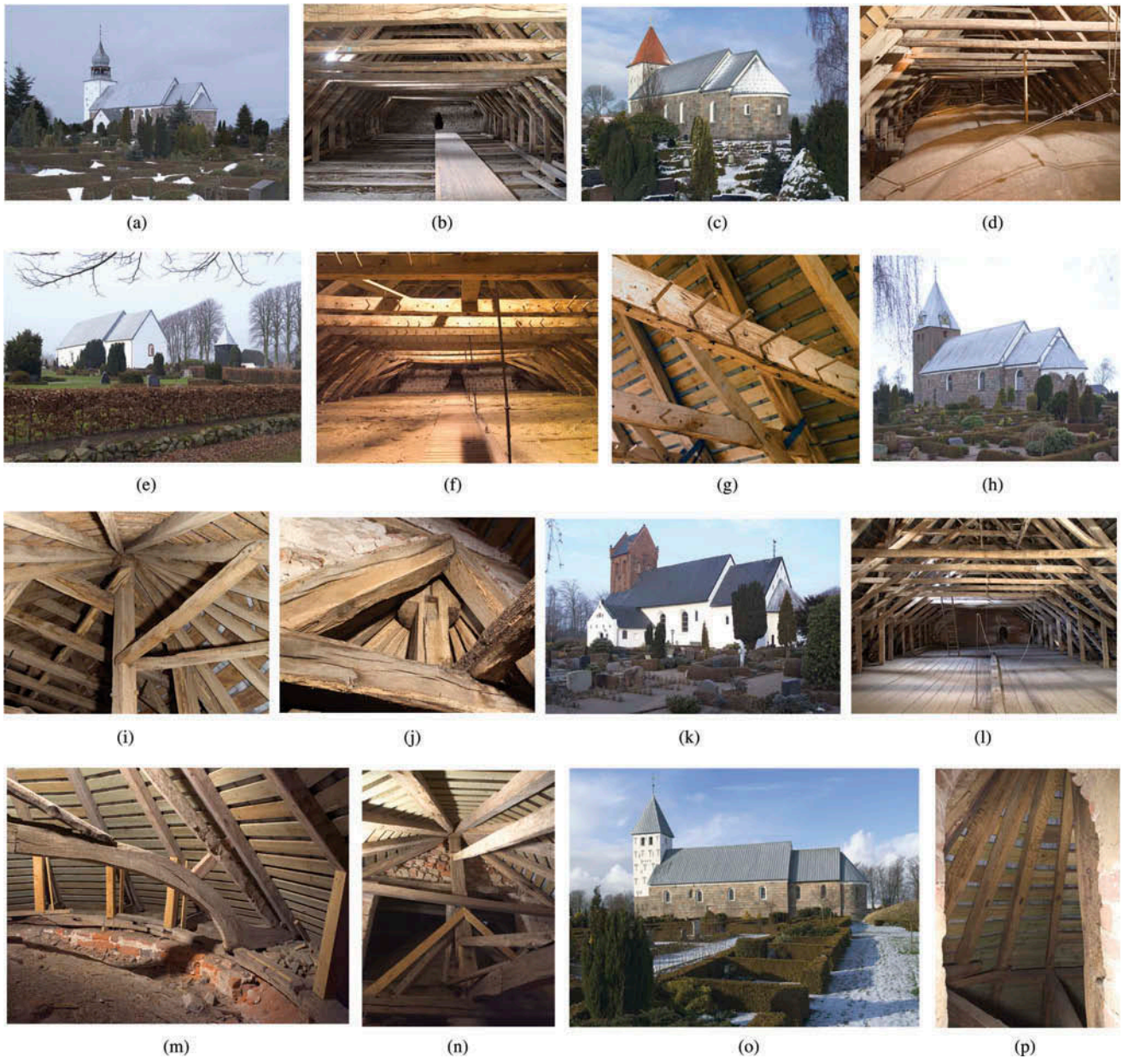


Figure 6. Some of the churches from the investigation. All exteriors from the south east. Photo Roberto Fortuna, February 2005. 6a–b: Andst Church, exterior and roof construction of the nave. 6c–d: Føvling Church, exterior and roof of the nave. 6e–g: Felsted Church, exterior and roof construction of the nave with inserted hooks used to hang up uniforms and weapons. 6h–j: Sdr. Hygum Church, exterior and roof construction of the apse with its kingpost. 6k–n: Bylderup Church, exterior and roof construction of the nave with the curved beam which runs across the vault of the apse and the roof construction of the apse. 6o–p: Brøndum Church, exterior and the partly preserved roof construction of the apse.

1200, when the oldest of the obtained datings of the *post quem* type and others are concentrated.[4]

All in all, for both chronological and technical reasons, one should refrain from calling any of the established truss types either Romanesque or Gothic. The technical development of carpentry will not have been associated solely with the churches, but would also have included the always far more numerous and undoubtedly equally complex solutions that non-ecclesiastical buildings required. One thinks of the possible relationship of the Roager and Arrild types to the presumed wall or head plate constructions that excavations of village houses and farms in both North Schleswig and Southwestern Jutland have demonstrated (Figure 9) (Madsen 1985 on head plate construction, Donat 1993, Sørensen 2003, p. 441, Smith 2004, cf. Smith 1982,

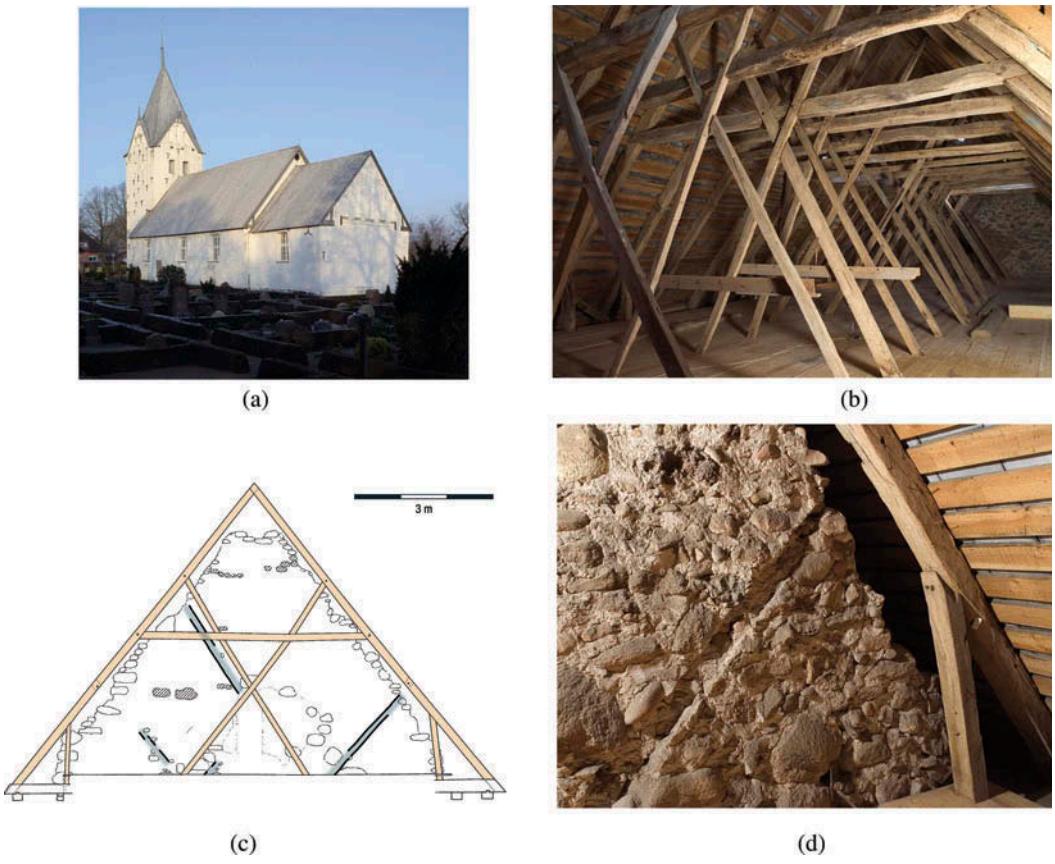


Figure 7. a. Arrild Church viewed from the south east. b. Roof construction of the nave viewed towards the east. c. Measurements of the west side of the gable between the nave and chancel. When the gable was built, the impression of a truss (shown in grey) of the same type as those found in the church today (shown in brown) was made in the masonry in front. d. The impression in the wall does not correspond to the empty hole from a similar strut in the standing truss in front of the gable. The nailed-on strut is of more recent date. To the right of the strut by the white slip of paper a sample was drilled out which showed that the tree in question was felled c. 1354. Measurements and drawing: Erik B. Fisker and Claus Feveile 2002. Photo: Roberto Fortuna, February 2005.

Søvsø 2012). Placing trusses on top of two parallel head plates in fact corresponds very much with the way that trusses and roofs are set on top of stone walls. No fixations between masonry and timber are used, the roof must stand supported by its own weight, nor does the placing of trusses in either of the two kinds of building need to follow either the row of posts or the architectural structure of the wall with window and door openings, etc.

On the other hand the upward dating of the types is not quite firmly established for exactly the two types of truss that used to be considered early, since both only passed out of use after c. 1400 – the Roager type perhaps as late as the end of the Middle Ages. The crossbeam trusses are underrepresented in the investigation, as they are normally associated with vaulted churches, but the type probably appeared in the investigated area as early as the 1200s. The collar-beam type is present from c. 1200, perhaps before, and in practice, together with the crossbeam type, becomes more and more dominant, and almost reigns supreme with the erection of new roof constructions in the churches of the area from the 1400s on, judging from the results of the investigation. Renewed, Late Medieval roof constructions of the crossbeam type on a number of the more substantial granite churches in the swathe from Ribe to the east do however shade the picture more subtly and shed light on the area's otherwise so little-known art of wood construction at the time. Although the crossbeam trusses in the stone churches are presumably associated most with vaults, it is not inconceivable that magnates in the area had carpentered houses with similar constructions, and that the renewal of a whole church roof with its considerable consumption of resources would have been an aspiration for a conscientious churchwarden.

The timber for the church roof constructions investigated is taken, as far as can be judged with a single exception, from the area in which the churches lie, and regional traditions would thus have been able to persist in

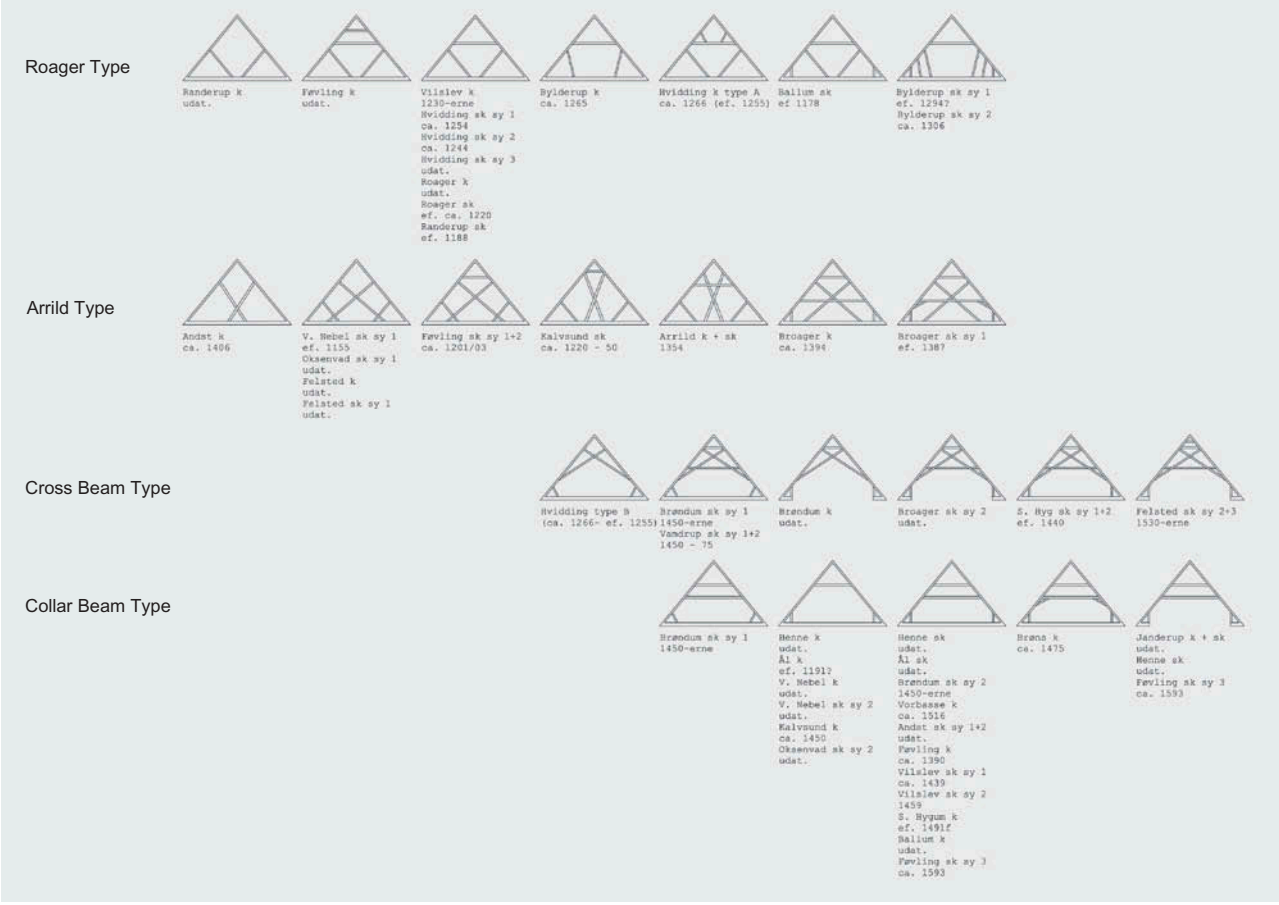


Figure 8. The truss types of the investigated church roof constructions arranged in the four types: Roager, Arrild, crossbeam and collar-beam type. Each type row is ordered on the basis of either the absence or presence of inside short struts. Truss types without short struts are in a group at the top left. They are only found in the Roager and Arrild types, which however are far from appearing only with struts. The crossbeam and collar-beam types always seem to be furnished with struts, but there is no basis in the material for claiming that roof constructions with struts came into use later than those without, although as suggested by the diagram they may be typologically younger. Trusses with or without struts appear from c. 1200 within all four truss types. The overlapping of types is long-lasting, and the Roager and Arrild types did not pass out of use until after c. 1400, unless the late examples from Andst and Broager are to be regarded as a kind of intermediate form between Arrild and the crossbeam roof constructions. With their association with the vaulting of the churches these are presumably underrepresented in the investigation, but probably the crossbeam trusses appeared as early as the 1200s. The collar-beam type is present from c. 1200, perhaps before. Drawing: Niels Erik Jensen.

Notes: Abbreviations: *ef.* after. *k:* chancel. *sk:* nave. *sy:* system. *udat:* undated. Brackets ( ) around a dating indicate that it has been inferred from another type of truss within the same closed system.

this field too. The extended forest Farrisskoven at the transition between Schleswig and the Danish Kingdom proper is the obvious supply source to point to, as well as the forest areas that could still be found right up to a very late date relatively far to the west in Southwestern Jutland. However, the preserved church roof constructions only represent a very limited segment of the production of medieval carpenters, and in the investigation we are furthermore talking about a body of material that mainly falls within the period from c. 1200 on.

In view of this, two churches from the vicinity of Ribe should be more carefully examined and compared. One is the church in Hvidding to the south west of Ribe (Figures 4 and 6) which tended to be considered as one of the first and oldest churches in the area built of calcareous tufa (Møller 1953, Danmarks Kirker 1957, p. 1133). Today its apse is a reliable reconstruction and only chancel and nave remain of the original building which shows a west extension from the end of the Middle Ages, but even earlier considerable alterations were carried out (Figures 10 and 11). Local magnates or churchwardens probably had the intention to adorn their church in a way that resembles the redesign of the building programme of the Cathedral of Ribe as it was carried out during the thirteenth century (cf. Krogh 1964, Madsen 1994). Correspondingly,

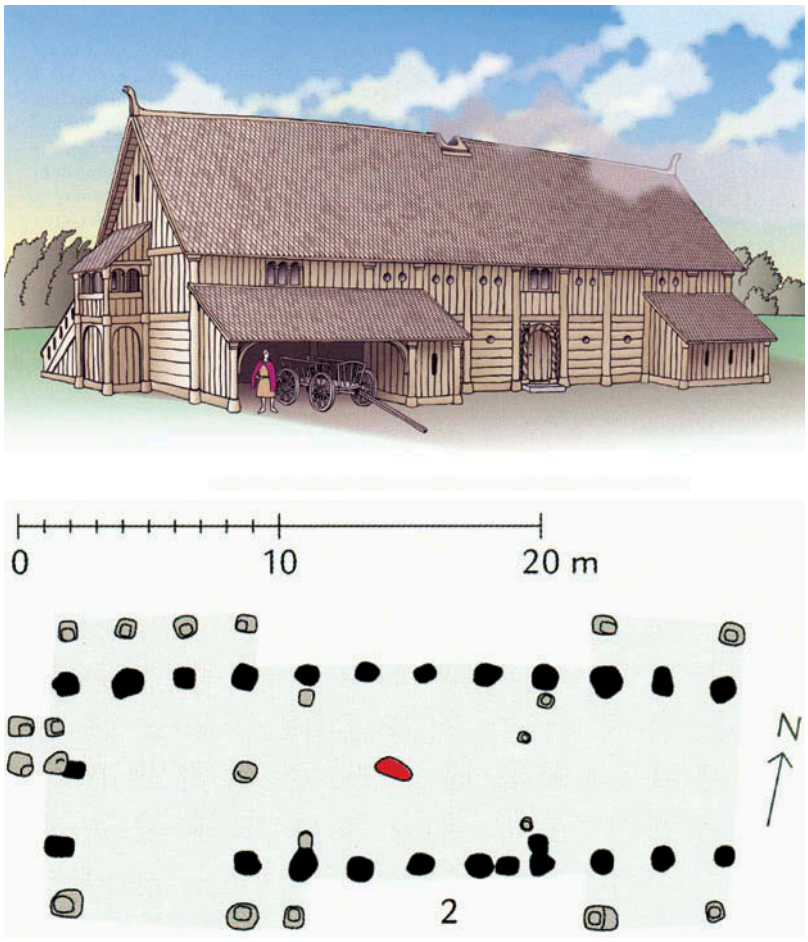


Figure 9. Excavation plan and reconstruction of a two-storey timber-built house in head construction from the excavation at the site Østergaard in North Schleswig, dated to the 1100s. Buildings of the same date with similar ground plan have been excavated just outside the city of Ribe. After Sørensen (2003).

dendrochronological datings from the roof of the chancel and nave in Hvidding seemed to indicate that the church was under construction during the first part of the thirteenth century and that its roofs were completed after the middle of this century.

The other example is the inland parish church of Kalvslund, some few kilometres east of Ribe (Figures 4 and 12). The dendrochronological dating of the roof structure and thus probably also of the completion of the nave of Kalvslund Church to c. 1220–50 – while no dating can yet be given for the chancel, except that it is unlikely to be much older – accords well with its former stylistic dating (Danmarks Kirker 1994–2003, p. 3345).[5] The church may be slightly older than Hvidding Church, and the similarity between the door design and the use of saw-tooth courses as decoration on both churches should be mentioned. While most of the building materials, i.e., the calcareous tufa stones for Kalvslund Church were bought and transported from as far away as the Rhineland, the granite in the interior was available from the eastern part of Jutland. As for the procurement of the timber, the analysis has shown that in Kalvslund oak from the Southern Jutland or North Schleswig area was used, and this applies almost without exception to all the church roofs in the area. Perhaps indeed the forest was not too far away, for toponymical research tells us that the very place name Kalvslund, like nearby Hjortlund and Hjortvad, is a 'forest clearance' name of fairly recent date and testifies to the spread of forest (*lund* = grove) – with deer (*hjort* and *kalv*) – rather closer to the west coast than was the case later (Hald 1975).

By all indications there was either originally or later thatched roofing on at least the nave of Kalvslund Church (Figure 13). This is suggested by rows of bored-in trenails in the tops of the rafters, which must be from the attachment of laths along the building. These would have borne the roof covering, which is thus unlikely to have been of lead, but may have been shingles, tiles or, as proven likely here, of straw thatch.

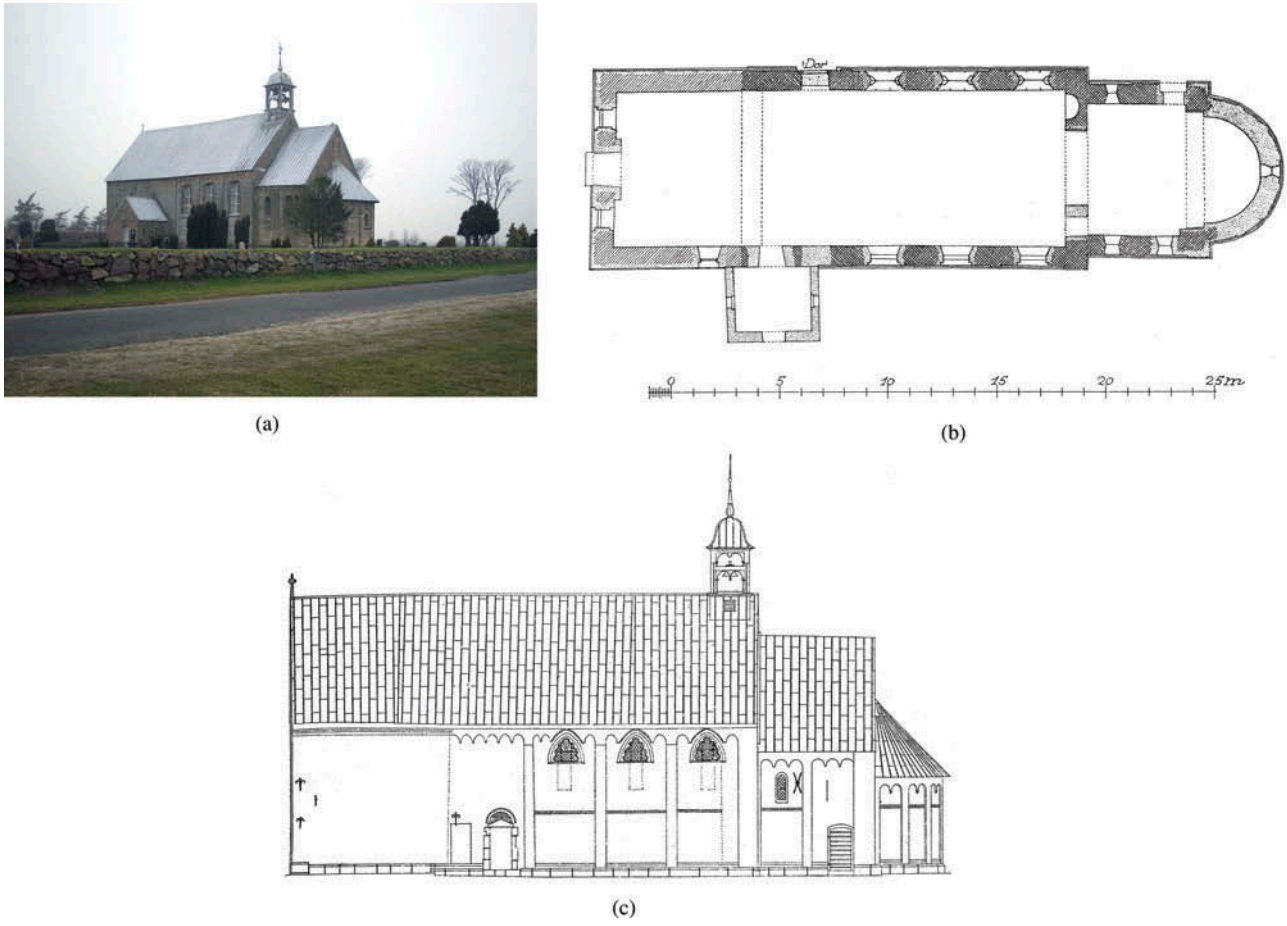


Figure 10. a. Hvidding Church, the church viewed from the south east. b. Ground plan of the church. c. Elevation of the north facade of the church. After Danmarks Kirker 1957, p. 1134–1135. Photo: Roberto Fortuna, February 2005.

The age of the thatched roof in Kalvslund may fall within the date range for the roof structure, if thatch, as suggested, was the first covering of the nave. The closest parallel to the thatched roof in Kalvslund is from the neighbouring church Hjortlund, where trenails have been observed in the rafters as in Kalvslund (Danmarks Kirker 1994–2003, p. 3345, Madsen 2005b). Østergaard 1961 and 1974 describes further parallels. Construction principles of thatched roofs have been described in detail by Rasmussen (1966). In addition, the two neighbouring churches are close parallels in terms of the construction of the gable between chancel and nave, which in both seems to have been of wood in the form of planks inset in the triangle formed by the gable truss (Figure 14).

Excavations inside the church in the 1950s led to the suggestion of a former wooden church at the spot which could perhaps also explain the quite flimsy joining of the nave and choir if the latter was raised against a still standing wooden church nave (Østergaard 1974, cf. Danmarks Kirker 1994–2003, p. 3345). This may still be possible, but the study of the roof has led to the conclusion that some of the special features of the extant building that might point in that direction perhaps have more to do with the construction of the roof. At all events any wooden church need not be older than c. 1200, while the nave of the stone church, judging from the dendrochronological investigations, appears to have been roofed in the period 1220–50. A transition from wooden church building to stone constructions at this time is far from unexpected in the western part of North Schleswig, and Kalvslund Church may, as pointed out, be approximately contemporary with the much richer church in Hvidding, lying close to the marshlands. The question is whether we should see this as evidence of, at the local parish level, a relatively late development in the form of intensified inland cultivation and settlement at the beginning of the High Middle Ages. Christianity and churchgoing in the Ribe areas can be traced considerably further back than around 1200, and the erection of stone churches in the city of Ribe is documented before 1200,[6] which does not mean that stone churches in the marshland parishes all came as

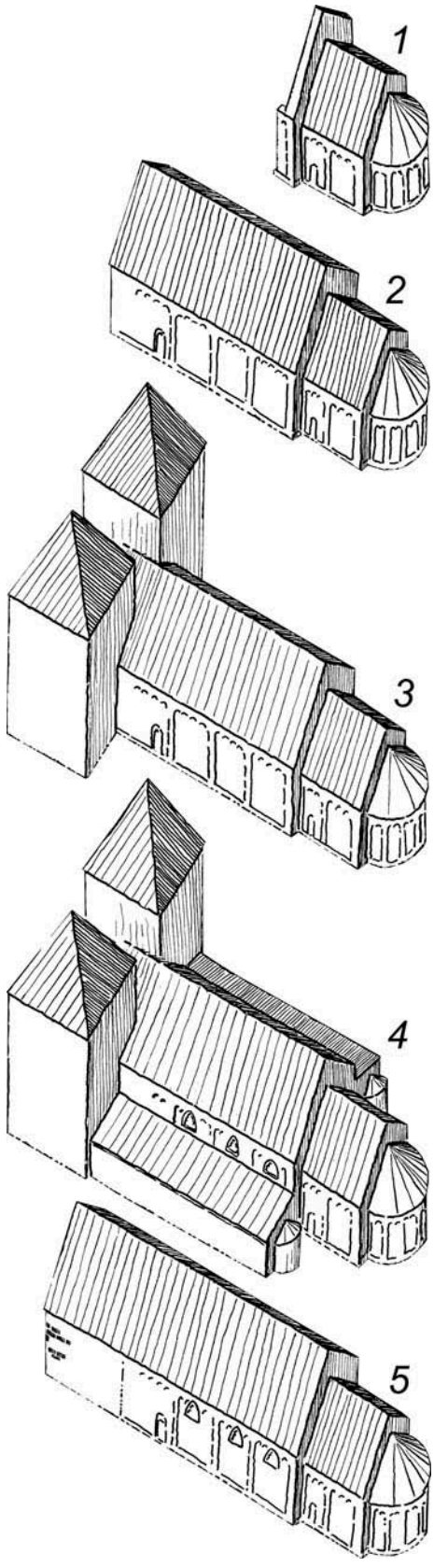


Figure 11. Hvidding Church, construction history. 1. Apse, chancel and the easternmost part of the nave including the rood gable. 2. The nave is finished. 3. A new western section, now disappeared, with two large towers and a vestibule in between is built. 4. The long walls of the nave are heightened, and trefoil windows are built in the heightened section, corresponding to the now restored state. The placing of the windows is due to plans for the erection of side-aisles, but it is not known whether these were ever realized. Any foundations have not been excavated. 5. The western towers collapsed and the nave was been lengthened with the present extension in brick. After Krogh (1964).

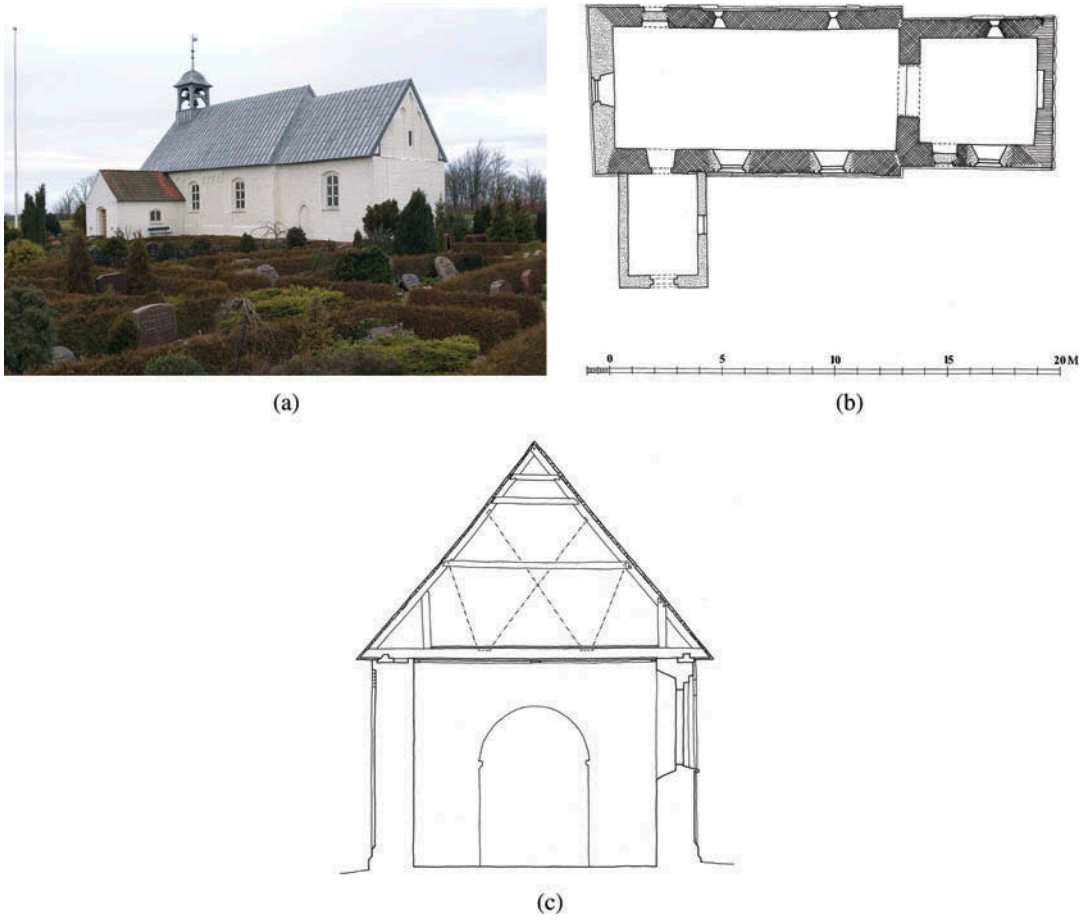


Figure 12. a. Kalvslund Church from the south east. b. Ground plan of the church. c. Cross-section of the church – the dotted line indicates the now-removed long diagonal struts. After Danmarks Kirker 1994–2003, p. 3347. Photo: Roberto Fortuna, February 2005.

early as that. At all events it may be that parishes which, like Kalvslund, lie inland, and whose resources, populations and church sizes always seem to have been smaller than those of the rich marshland parishes, only acquired their own church buildings from the 1200s on. The thatched roof of Kalvslund Church was not necessarily the result of inadequate funding – for as the predominance of calcareous tufa in the masonry clearly demonstrates, the builders of Kalvslund Church, like their fellows in the city and in the marshland parishes, were able to benefit from the supply of building materials from the Rhineland. But this meant that they were also subject to any fluctuations in the trade of i.a. lead.

One last example is the roof of the church in Sædding north of Esbjerg, lying some 60 kilometres from Ribe. This is in fact the church roof which Sophus Müller chose as his starting point for his paper from 1887, presuming that its nearly semicircular trusses represented the original roof of the church, being open to the nave (Figure 2). The closest parallels for this rather unique construction have been found in another three churches in Western Jutland and dendro-investigations simultaneously point to datings in the second part of the thirteenth century, or the first decades of the fourteenth century (Bonde and Madsen forthcoming). Nothing proves that this type of roof should be the original in any of the four churches, no matter whether it remained open to the nave or had the form of an oblong barrel vault with wooding clading on the trusses' bottom side. In either case the inspiration seems to have come from the similar roof constructions in Flemish or French ecclesiastical buildings as well as in vernacular houses in, e.g., Brugge and Ghent. Probably an open, barrel vaulted roof had to do with a wish for more light and space, giving room to new arrangements of the Rood Altar with for instance a tall crucifix which could then be placed above the Triumphant Arch to the choir. Anyway these few known examples of open or barrel vaulted roof constructions being built into West Jutland Romanesque parish churches in order to substitute their original roofs do reflect the main economic and cultural influences of the Late Middle Ages from Flanders to South Western Jutland.

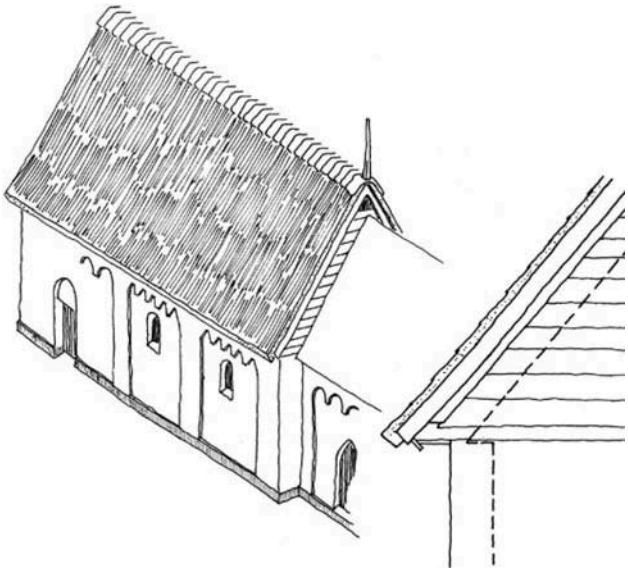


Figure 13. Kalvslund Church, suggested reconstruction of the covering of the nave with thatch and a ridge of turf as well as a vertical pole in the east gable. One can glimpse how the east gable of the nave may have been closed off with horizontal boards. How the chancel was covered at that time is unknown, so only its outline is suggested. A detailed proposal for the construction of the southern corner of the gable is also shown. The interior appearance of the gable construction is shown on Figure 14. Drawing: Niels Erik Jensen.

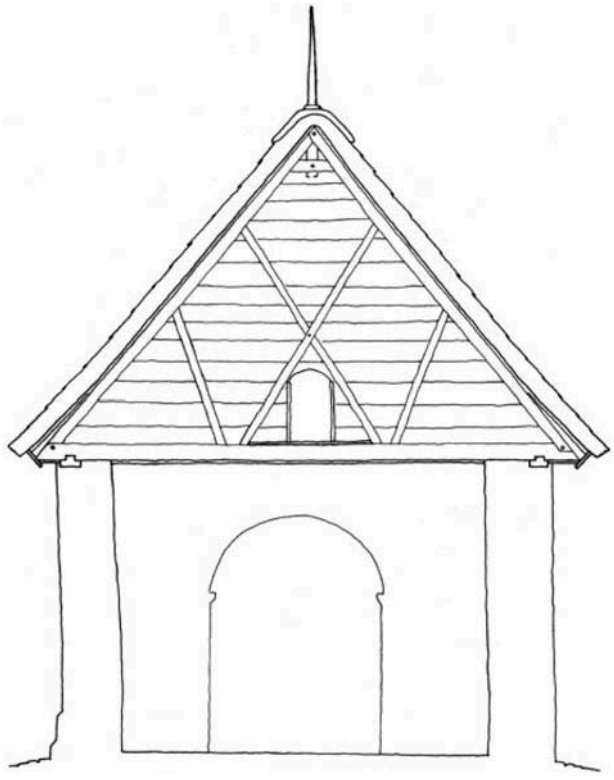
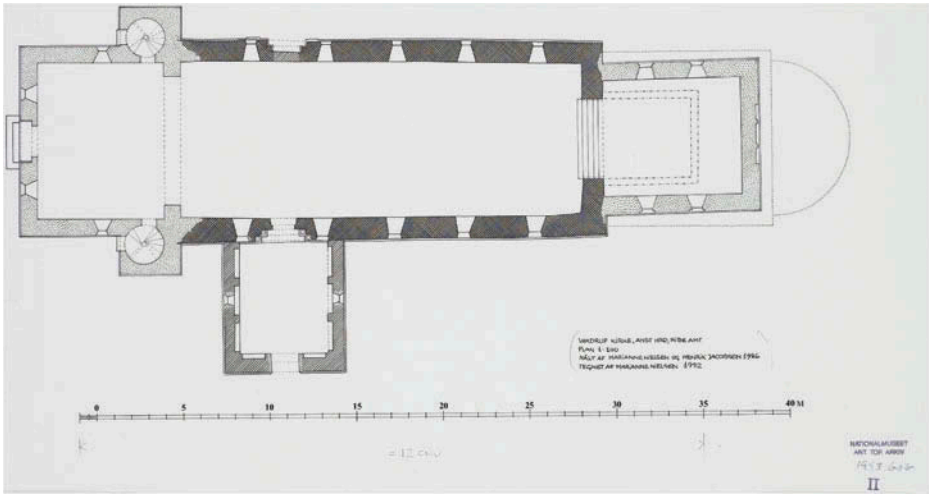


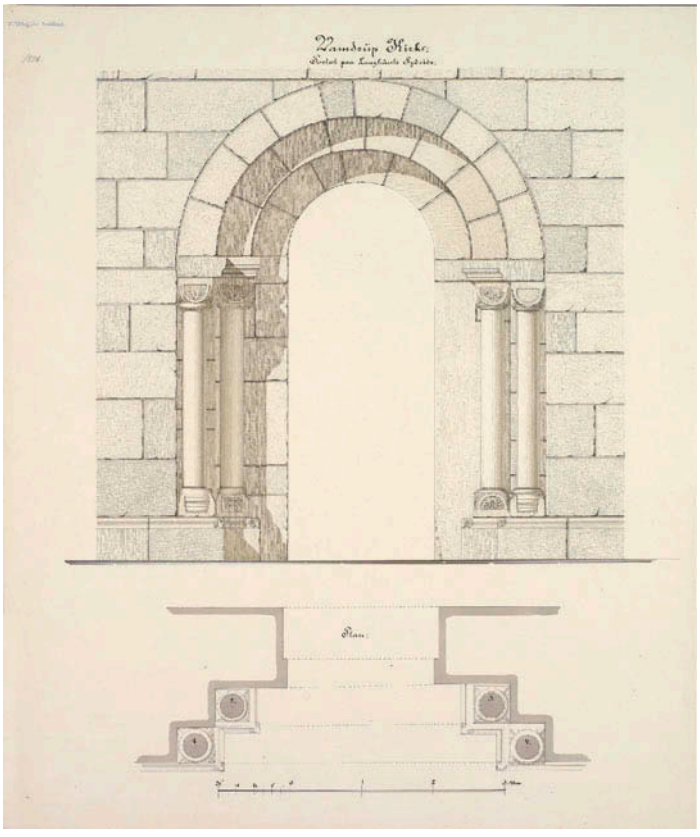
Figure 14. Kalvslund Church, sketched reconstruction of the eastern gable truss of the nave viewed from the west (that is, from ceiling of the nave) with added terminating boards and diagonal struts on the inside of the board wall. Figureshows that part of the gable which is visible from the outside. Drawing: Niels Erik Jensen.

Looking back on the whole project it has only been possible to a limited extent to fulfil the hope that the church roof constructions of the area would contribute, thanks to dendrochronological analysis, to the dating of the building materials of the church, that is of the granite, the calcareous tufa, the bricks and the succession in which they replaced one another. This limited success is partly because there are only a few cases where one can demonstrate contemporaneity of the discontinuity in construction and a change in materials in the masonry on the one hand and on the other hand in the roof constructions that must in practice be considered contemporary with the walls. But in some of the churches that have not yet been subjected to a major overall investigation, it may be possible to obtain results in this field. There is yet another perspective for continued investigation in the possible dating of the use of granite column portals in a number of granite churches in the time around 1200, for instance in Vamdrup (Figure 15) (Madsen 2007, p. 57+59, cf. Madsen 2000. Danish granit church portals are published by Mackeprang (1948). Ribe Cathedral too is graced with granite column portals (Figures 16 and 17), while the calcareous tufa churches in the close hinterland of Ribe have no column portals. In that respect the information on the age of the roof construction in the village churches of the Ribe area, as suggested by the investigation, may contribute further to the discussion of the age of Ribe Cathedral and its relationship with the architecture of the region in general. If we base our projections on the datings of the partial *post quem* type obtained, two possibilities emerge. One is that the erection of calcareous tufa churches is more likely to have taken place after than before 1200, and that the use of bricks began almost at the same time or only a little later. If the cathedral was the crucial source of the architecture and the choice of materials for the village churches, this raises the issue of whether its beginning should be pushed forward from the proposed period, 1150–1175, to the last quarter of the 1100s; or secondly, if the datings from the village churches are an expression of the revision of their architecture and of all-encompassing renewals of the roofing constructions investigated in the period after c. 1200 – then the start of the cathedral construction need not necessarily be affected, but at the same time the possibility is opened up that the calcareous tufa churches without portals either followed on from the cathedral in its first version or have their precursors among even earlier calcareous tufa buildings in Ribe. Given that there is probably a sisterly relationship rather than a subordinate mother–daughter relationship between the cathedral and the village churches, the first of the two suggestions here should be judged the most likely. Because of the extent to which the roof

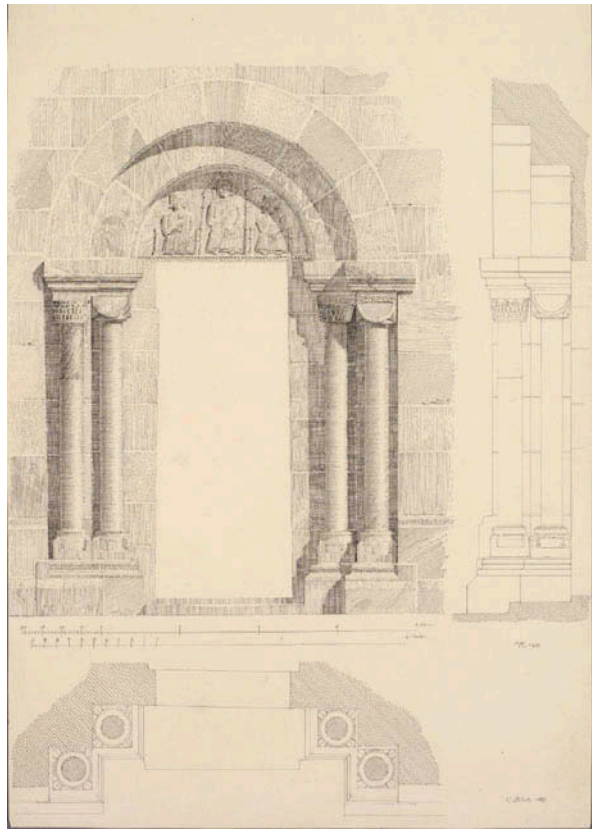


(a)

(b)



(c)



(d)

Figure 15. The two churches in Vamdrup and Andst are situated in the middle of Jutland east of Ribe (Figure 4). a. Vamdrup, ground plan. b. Vamdrup, the church from the south east. c. Vamdrup, south portal of nave. d. Andst, south portal of the nave. Photo: Roberto Fortuna, February 2005. Measurements and drawing: Danmarks Kirker 1991–1994, p. 2634+2636 and F. Uldall 1888.

constructions of the portal-decorated granite churches have been replaced, the potential for obtaining a further dendrochronological dating basis from these churches is relatively modest. As far as the calcareous tufa churches are concerned, though, there is still untested material available for an extended analysis of the age of the roofing of some more of these churches. And although, as the investigation has shown, we have regularly produced evidence for replacement of the roof construction, such a result also always gives us a deeper understanding of the church in question and the region to which it belongs, and thus, like the whole regionally based investigation of

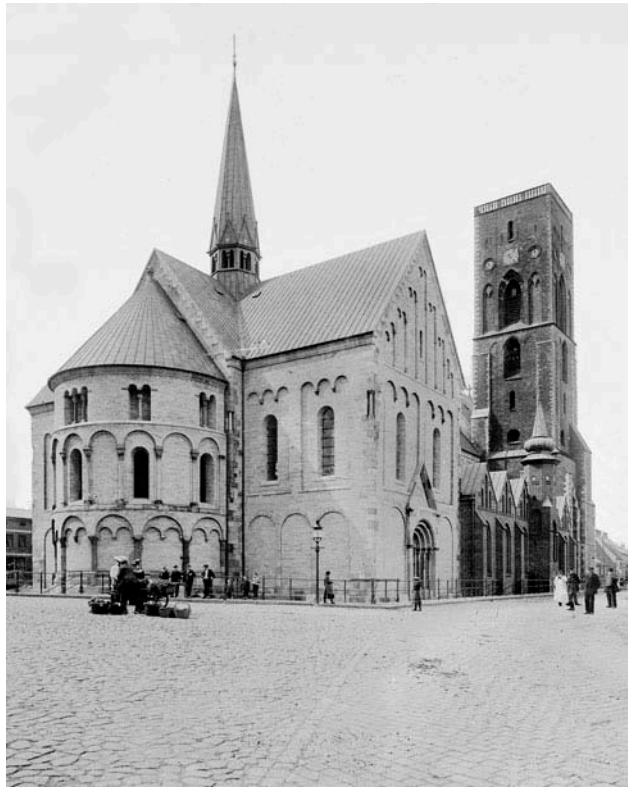


Figure 16. Cathedral of Ribe from the North East. The present look of the church is due to its latest restoration around 1900 which preserved the church's remaining Late Medieval additions, that is the brick built Great Tower to the North West and its two outer side aisles. The Romanesque basilical church with its protruding transept was erected by inspiration from the Rhineland using imports of Rhenish tufa stones and sandstones and some Jutish granite blocks. No choir was ever erected, and the apse is directly connected to the transept. A central tower on top of the crossing was planned but probably never raised and similarly only two slender west towers were built in order to flank a central tower of which only the massive and remaining ground storey was constructed. Photo: Hude, the National Museum, around 1900.

(a) (b) (c)

Figure 17. The portals of the cathedral in Ribe. a. Southern transept, the original portal with its slightly horseshoe-shaped arch and granite tympanum and its double set of columns originally ended horizontally. This was supplemented by adding the triangular sand stone relief on top of the portal arrangement, probably shortly after 1250. b. Northern transept and c. West entrance – the arch above the doorway is slightly pointed, probably dating from around 1225. Photo: Roberto Fortuna, 2005 and 2010.

Southwestern Jutland and North Schleswig roof constructions shortly presented here, underscores the need to continue with other, larger areas.

Finally it certainly also bears witness to the interdependent relationship between town and country and in this case, too, between an area which was on the one hand a prosperous innovation zone for the urbanizing influences from northwestern Europe, and on the other hand thereby becoming a part of the supplying hinterland of commercial centres such as Bruges (Madsen 1997, 2000). However, the same zone of South Western Jutland probably also maintained and further developed its traditions in the technical field of carpentry along with being open to inspiration from stone church building.

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I wish to thank Dr. John Smith for his kind support and fruitful corrections. James Manley took care of the translation into English.

Notes

1. Final publication in Madsen (2007), with a catalogue of all investigated churches and their roofs including the dendrochronological results.
2. The project was granted by the Carlsberg Foundation, the Museum Councils of Ribe and Sønderjylland and the National Museum. Project files are kept in the museum of Ribe (Sydvestjyske Museer), and in the National Museum, cf. Madsen 2007.
3. Madsen (2005a) gives a detailed version of the investigation with references.
4. Madsen (2007, p. 39); Binding (1991, p. 49ff) dates the upcoming of interior struts in the Rhine-Mosel Area to the period from 1200 and onwards. In Westphalia they appear in the middle of the thirteenth century. Provided that these datings are reliable they seem to be later than the ones obtained from the investigated churches. This means that these German examples hardly were the ones to inspire the Danish carpenters concerning this important detail.
5. Madsen (2005b) with details and references.
6. About 860 Ansgar was granted permission by the king Harald Klak to build a church in Ribe. First mention of a stone church in the town implies its erection shortly before 1134 (Skovgaard-Petersen 1981, p. 39 and 60). The building of the present cathedral was initiated about 1150–75, cf. Madsen 2007, p. 63. The deserted parish churches in Ribe of Sts. Peter, Clemens and Nicolai were probably also of twelfth century date and were like the cathedral erected in calcareous tufa. Finds from new excavations south of the cathedral indicate that a stone church most likely was erected in the area prior to the present cathedral.

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