

Hemse Stave Church Revisited

BY GUNNAR ALMEVIK & JONATHAN WESTIN

Abstract

During a restoration of the Romanesque church in Hemse in 1896, the remains of a stave church were found as reused floor tiles. The discovery was important at the time, providing new information to a prestigious research field with few sources of knowledge. Today, the remains of Hemse are esoteric and inaccessible for scholarship. The stave church material in the present museum context seems to have one function, to communicate an age value. The leading question in this article is, what more could we retrieve from this old archaeological material? We may agree that the museum's archaeological collections and the stave church remains are valuable sources, but for what new kind of knowledge?

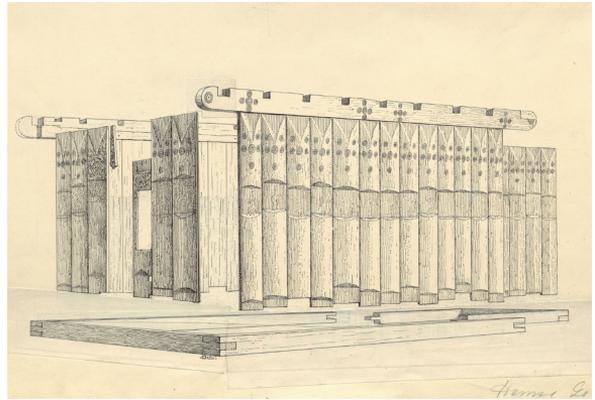
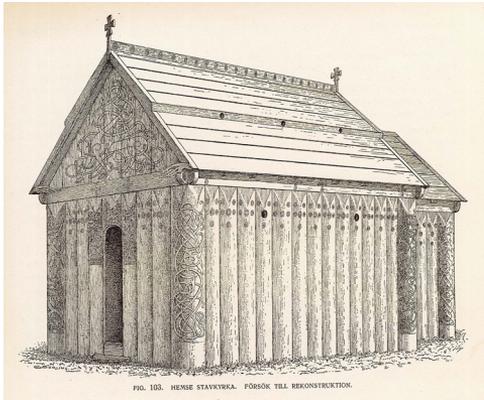
This article presents the process and outcome of an in-depth examination of the material remains and archival records of Hemse stave church. The aim is to develop or revise how this wooden church may have been constructed and appeared both outside and inside when it functioned as a building. The research method uses three perspectives that give access to different paths of knowledge: a discursive perspective, a forensic perspective, and a dwelling perspective.

The research results are contextualized in an interactive model of Hemse that provides a visual experience that gives a sense of the stave church as a real place and not just a theoretical space. The results are grounded on empirical evidence but also on the intellectual discourse of which it is a product. The reconstruction is less of a static representation of our knowledge than a simulation or a research laboratory through which hypotheses can be tried and both researchers and the public can be engaged in a dialogue.

Introduction

During a restoration of the Romanesque church in Hemse in 1896, the remains of a stave church were found as reused floor tiles. The local contractor Nils Pettersson informed the *Royal Academy of History, Letters and*

Antiquities expert Emil Ekhoff, who arrived at the construction site the very next morning. Ekhoff collected in all 67 pieces of the wooden church that were bought from the parish and brought from the island of Gotland to



Figs. 1–2. Reconstruction drawing and context of material evidence by Olof Sörling, published in Emil Ekhoﬀ’s research opus *Svenska stavkyrkor* 1914–16. The construction is of oak with vertical wall timber between a sill and a top plate. All “staves” have been cut in the lower part, but a groove in the sill indicates that the staves were jacked in the sill but continuing into the ground. The wall staves have a convex outer form with decorative concentric rings in a cross shape at the top and a characteristic carving at the plate. Ekhoﬀ’s interpretation borrows forms from the Norwegian stave churches of Urnes and Hopperstad, and faraway Greenstead church as well as nearby Garde. ATA.

the *National History Museum* in Stockholm (Ekhoﬀ 1914–16, 23). At the time there were, and still is, only one preserved stave church in Sweden, namely Hedared in Västergötland. Hemse was not as splendid as the Norwegian national treasures Urnes or Kaupanger, but still with archaic forms and traces of refined ornamentation of which Hedared had none.

The discovery of Hemse was important at the time, providing new information to a prestigious research field with few sources of knowledge. The investigation caused an intense debate with the Norwegian scholars on how to interpret and denominate the construction (*Forntidsminneforeningens årbok* 1898, 48ff.). In 1910 the National History Museum produced a new exhibition on Romanesque church art, where Hemse stave church was staged in centre of display. Decorative parts from the west portal were fitted in a reconstructed stave church facade and used as entrance to a diorama of a church space (Bengtsson Melin 2014, 64). Bernhard Salin, later to be director of the National Heritage Board, personally arranged the exhibition.

When Emil Ekhoﬀ published his opus *Svenska stavkyrkor* (“Swedish Stave Churches”, 1914–16), Hemse was brought to the fore as the main example. The National History Museum’s “artist” Olof Sörling provided detailed documentation drawings, and a reconstruction that has been frequently reproduced in succeeding research to illustrate a Swedish stave church. The reconstruction drawing of Hemse appears in the mandatory folder with the church history in Hemse, in the monograph about Hemse church in the national inventory *Swedish Churches* [Sveriges kyrkor] (Lagerlöf & Stolt 1969), in various exposés of Gotlandic churches (e.g. Lagerlöf & Svahnström 1991), in Anders Åman’s outline *Träkyrkor i Sverige* (“Wooden Churches in Sweden”, Åman & Järfeldt-Carlsson 1999) and Claus Ahrens’ overview of *Die Frühen holtzkirchen Europas* (“The Early Wooden Churches of Europe”, Ahrens 2001). Though Ekhoﬀ’s investigation and illustrated reconstruction of Hemse has been referred to, reproduced and also in some respects criticized, the sources has not

been thoroughly revisited and revised. The reconstruction drawing has become what Jean Baudrillard calls a *simulacrum*, a conjured copy that supersedes the original as reference to historical truth (Baudrillard 1994).

Today, the remains of Hemse are esoteric and inaccessible for scholarship, distributed in various spaces for deposit and display. In the National History Museum, the reconstructed western portal is still in the exhibition, but now placed against a wall and lifted slightly from the ground hanging like a painting. The entrance is used as a frame for a wooden sculpture of a sitting bishop. The display is a contradiction in terms of a building, providing no path to experience the exterior or interior church space as something real and tangible for the human hand. The archaeological remains in this museum context seem to have one function, to communicate an age value. The leading question in this article is, what more could we retrieve from this old archaeological material? We may agree that the museum's archaeological collections and the stave church remains are valuable sources, but for what new kind of knowledge?

Research aim and method

The aim of this research is to reinvestigate the archaeological building remains from Hemse and develop or revise how this wooden church may have been constructed and appeared both outside and inside when it functioned as a building. The reconstruction drawing of Hemse (Fig. 1), signed by Sörling and published by Ekhoﬀ 1914–16, provides a perspective of the church exterior from the south-west. The reconstruction drawing bestows distinct and seemingly inviolable qualities on history. The construction of the nave and chancel has round corner staves with extensive decoration. The staves or wall planks are vertical, anchored in the ground and fitted

in a decorated top plate with extended corner joints. There are two small windows placed high in the south facade and three more openings in a clerestory-like elevation in the sectioned slope of the roof. The doorway in the west portal is open, but offers no glimpse of the interior space. On what evidence is this reconstruction based? What would we see if we could step over the threshold of this tall, narrow doorway?

Our research interest in the appearance of a single monument may seem simple, but we will argue that an evidence-based visual reconstruction of a particular historic artefact may be a scholarly challenge. Our starting point is the material remains of Hemse, but the interpretations of this incomplete source require a *bricolage*, where a diverse set of sources are consulted and triangulated (Almevik 2012; Mogren *et al.* 2009). Furthermore, an object like Hemse stave church has to be examined in its twofold present form, as both an historical object and a research object. We want to ground our research on empirical evidence but also on the intellectual discourse of which it is a product (see Mol 2002, ix). Hence, our solution is a method design through three perspectives that give access to different paths of knowledge: a discursive perspective, a forensic perspective, and a dwelling perspective. The method design also recurs in the arrangement of the article.

The first two sections present a *discursive perspective* aiming at eliciting relations between the structure of narratives that explain the research object and the motives and methods in the production of history. It is a kind of archaeological excavation endeavour with reference to Michel Foucault, to unfold the layers of interpretations that have intersected Hemse during more than a century as both a research object and a museum object (Foucault 2002). The first section focuses on the process of discovery and formation of a discourse of Hemse as a conspicuous example of a Swedish

stave church. The second section focuses on succeeding excavations of two stave churches in the nearby locations Silte and Garde, and the scientific construction of a stave church typology where Hemse represents a transition from earth-embedded staves to a ground plate stave construction.

The second perspective of the article looks at the wooden construction as a primary source of knowledge. This *forensic perspective* takes us on a journey to trace both the whereabouts of the archaeological remains, and the qualities in form and substance that may lead to new interpretations. The forensic perspective refers to a criminological investigation method aimed at bringing evidence to a specific act of significance (Almevik 2012; Almevik & Melin 2016; Almevik 2017). The approach follows what Carlo Ginzburg calls a “paradigm of clues”, using a semiotic pragmatism to describe the seemingly insignificant detail and re-enact a system of meanings to uncover the traces of events which the observer cannot directly experience. It is a general archaeological premise: “When causes cannot be repeated, there is no alternative but to infer them from their effects” (Ginzburg & Davin 1980, 23). The forensic reinvestigation of the stave church material is not unlinked to previous research, but rather a dialogue to test, attest or contest previous observations and statements.

The third perspective leads to the result that is a simulation of a multi-sensory experience of Hemse stave church. The dwelling perspective refers to Tim Ingold’s investigation of skills and argumentation for an eco-dynamic approach, “which situates the practitioner, right from the start, in the context of an active engagement with the constituents of his or her surroundings” (2011, 5). The means in our case is not a full-scale physical processual reconstruction, but a Virtual Reality (VR) reconstruction that both encompasses a step-by-step enactment of a building process, and

connects cultural historical interpretations to the building’s effect on our senses. Through the VR reconstruction, the *space* of Hemse can be experienced as a *place*, a “humanized” space that is tangible for the human hand (Norberg-Schulz 1980). The affordances from the agential meshwork that Hemse stave church constitutes is examined through various aspects that make the space a place, such as artefacts, order, character, light, and time (Ingold 2007; Gibson 2015 [1979]; Dmitruk 2017). Hence, following Maurizio Forte, who proposes a move from basic interaction to feedback, behaviours, and embodiment (2014), we approach the act of reconstruction with a desideratum to explore a possible turn from an inviolable visualization process to an open-ended simulation process.

“On the correct use of the term stave church”

Emil Ekhoﬀ presented the first results from the investigations of Hemse in *Ny Illustrerad Tidning* already in 1896. He clearly established the differences in the construction of Hemse and the Norwegian stave churches: “The properties of the plates in the frame clearly show that corner posts, which are an important part of the Norwegian stave churches, have not existed in the Hemse church” (1896, 382). To advocate the use of the term stave church despite the difference from the Norwegian wooden churches, he derives the term *stave* etymologically as a traditional term for raised wood, and suggests a definition of the type as: “a building whose walls consist of vertically raised timber, not as the corner-jointed building with horizontal wood” (1896, 374).

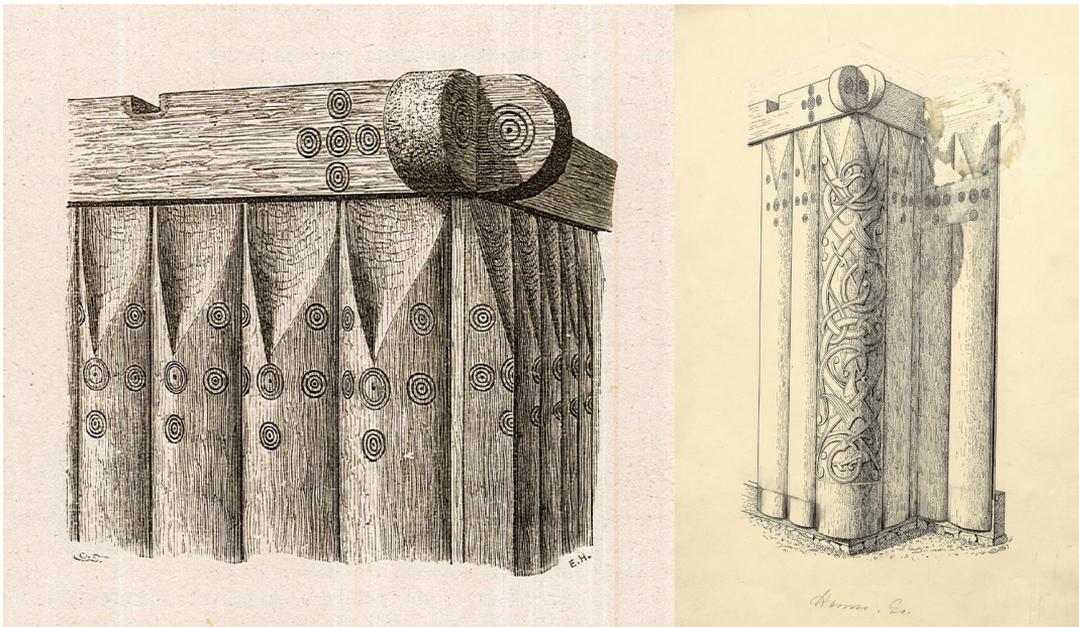
Ekhoﬀ’s use of the term stave church caused a reaction among contemporary Norwegian scholars, and the first to defend “the correct use of the term stave church” was Herman

Schirmer, at the time chair of the Society for the Preservation of Ancient Norwegian Monuments [Fortidsminneforeningen] and later director of the National Heritage Board. The debate was published in the Society's yearbook in 1899 since *Ny Illustrerad Tidning* dismissed the Norwegian objections. "Stave church", Schirmer declares, "is a modern word, clearly not known in our medieval literature" (*Fortidsminneforeningen* 1899, 48). He rejected Ekhoﬀ's definition of the term stave church as a raised timber wall, and proposed that it instead refers to the particular constructional features in the Norwegian tradition: "The only connection concerning churches where staves exist, is corner staves, namely the very constructional part of the building that you have shown has not been present in the construction of Hemse church, as well as the stave plates [staflægjur], the horizontal wood that rests on top of them, are supported by them and connects them" (*Fortidsminneforeningen* 1899, 48). Schirmer

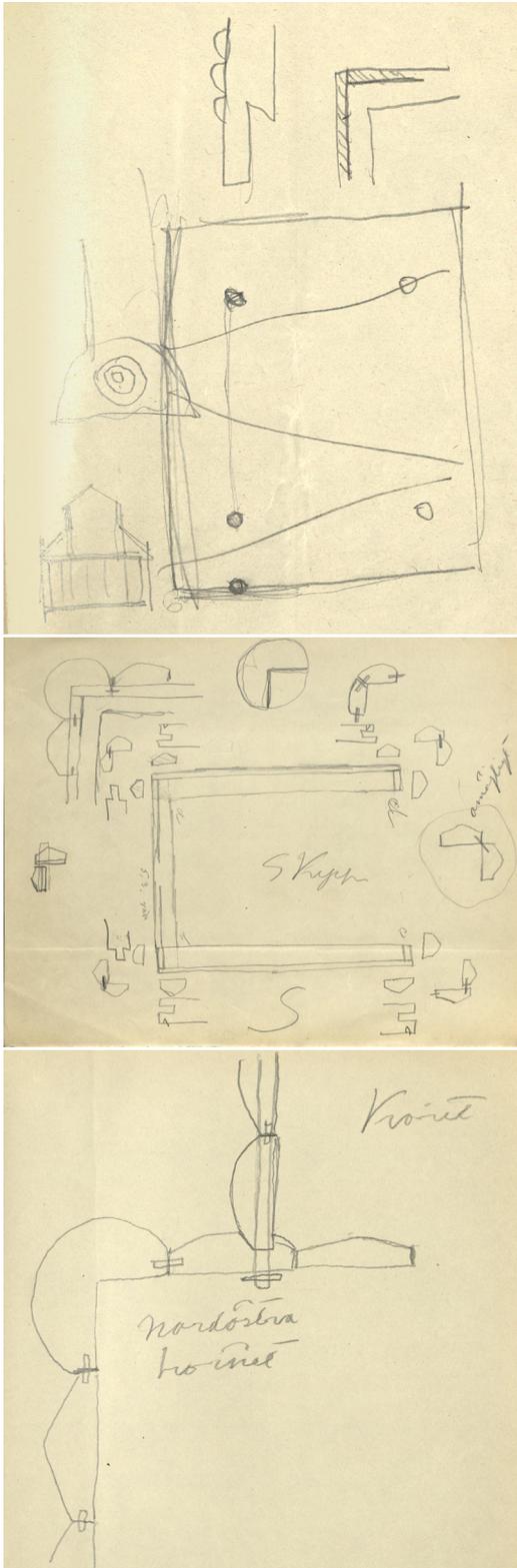
concludes that "Hemse raised timber church would probably be an adequate denomination" (*Fortidsminneforeningen* 1899, 49).

The debate has a gravity with more at stake than academic adequacy and prestige: it concerns the branding of *stave church* as an immaterial property with strong implications for national identity. Leif Ancker has shown in recent historiographical research how the Norwegian stave churches were "discovered" and reevaluated as national monuments in the 19th century, and how this patrimony at the time of the debate was institutionalized and internationally recognized in the European academic community (2016). No Swedish curator should infringe on this prosperous heritage. Nevertheless, Echolf stuck to the concept and used the brand to entitle his opus "Swedish Stave Churches", where Hemse church is put forward as the grand example.

One significant detail and trace of this debate is the construction of the corners of Hemse church. In the reconstruction drawing



Figs. 3–4. To the left, the first interpretation of the construction with vertical wall timber without a corner post presented in 1896 (Ekhoﬀ 1896, 376). To the right, the final reconstruction from 1914–16 with a construction with a structural corner stave with ornamentation derived from Urnes. ATA.



there are round decoratively carved corner staves, very similar to the oldest preserved parts of Urnes stave church. How did Ekhoﬀ's interpretation of the archaeological material change, from a statement that it "clearly shows that corner posts [...] have not existed" to this appearance very similar to idea of what the oldest version of Urnes might have looked like?

The time lapse between the discovery of Hemse and the publication of the full investigation encompasses almost two decades. Ekhoﬀ cooperated with Sörling, not only with the final illustration drawing, but also during the process of interpretation. The standard method was that Sörling made a kind of contour sketches in planar-projected elevations of the stave church parts at a scale of 1:25. Ekhoﬀ made notes on these contour sketches and used them as templates in reconstruction experimentations (Fig. 5–6). The preserved archival documents from the investigation of Hemse clearly show that the main concern was the Norwegian connection with the corner stave (Fig. 7).

The accumulated data from the decades of investigation is extensive, and the final product discloses the problems Ekhoﬀ had in managing the research material. Though the archive contains page after page with minute measurements in millimetres of each and every stave, notes on every gutter and notch, the first published examination of the material from the year of discovery is more accurate than the extensive descriptions in the concluding research almost two decades later. In the final presentation of Hemse the measurements on the ground plan of the church are not presented except through a ruler accompanying a drawing of the sill showing a length of the nave that is half a metre longer than it actually is: 8.4 metres

Figs. 5–7. Drawing from Ekhoﬀ's personal archive, indicating the work process. ATA.

instead of 7.87 metres. Furthermore, though only one full-length chancel sill was listed in the record of collected items from Hemse, in the final presentation one more sill appears, now providing full information about the church plan. It seems that Ekhoﬀ got detached from the primary sources, and made his final publication partly based on misinterpretations of his own fragmented representations.

An informative imprint of a stave church

Ekhoﬀ remained an authority in the field of Swedish stave churches, and the publication of Hemse had an impact on succeeding research. The debate on the stave church brand died down, and in the encyclopaedia of the Nordic Middle Age (*Kulturbistoriskt lexikon för nordisk medeltid*), the authors of the headword “stave church” briefly conclude that there exist two parallel definitions of the word: in Swedish referring to standing wall timber, in Norwegian meaning the corner stave in a roof-bearing framework (Bjerknes 1972, 95; Anker 2016, 17). Hemse is used not least by Norwegian researchers like Kristian Bjerknes (1972, 99), Roar Haugli (Haugli 1976, 192) and Peter Anker (Anker 1997) as an example of a transitional type, between the so-called palisade construction with earth-embedded walls of half timber, mainly represented by St Maria Minor in Lund, and the stave church “proper” like most of the preserved Norwegian stave churches with -bearing corner staves placed on a sill (see Fig. 8).

Scholars contemporary with Ekhoﬀ, however, raised critical questions, particularly about the reconstruction. The art historian Johnny Roosval suggested that Hemse had a hipped roof like historic churches in the Baltic region, and thus no gables (Roosval 1924). Gerda Boëthius questions the corner post and the reference to the church in Greenstead

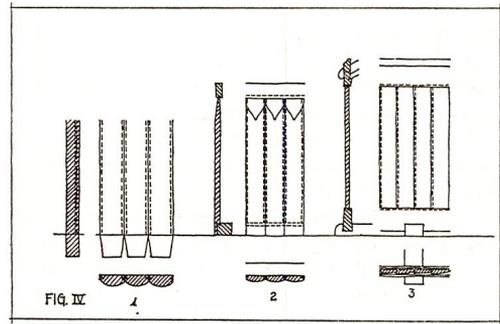
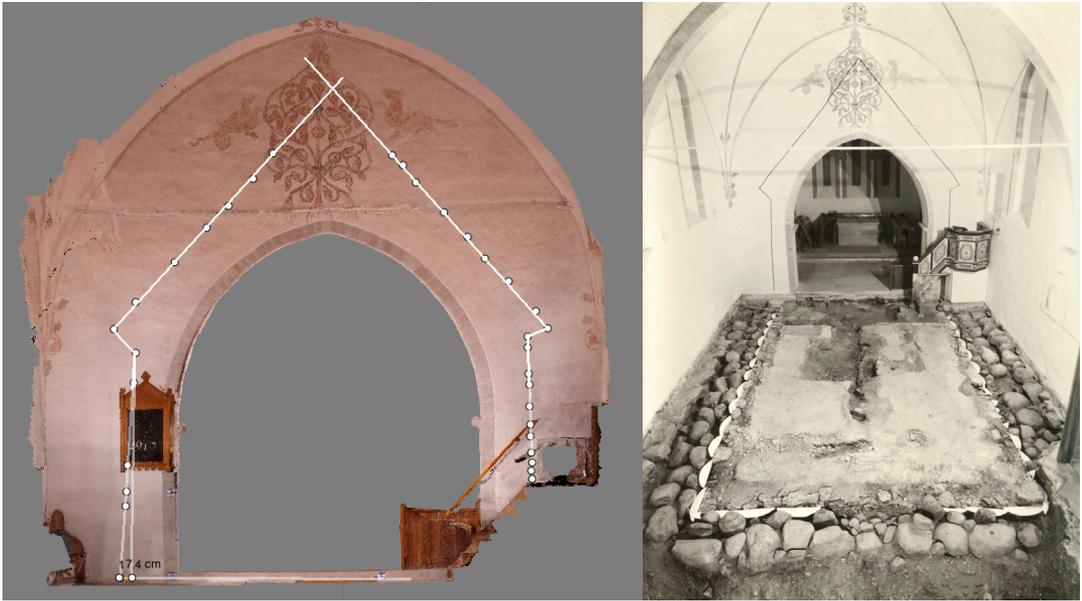


Fig. 8. Drawing by Kristian Bjerknes of the development of types of stave constructions, from earth-embedded to sill-carried walls. In this scheme Hemse represents a transitional type. Drawing: Kristian Bjerknes (1972, 99).

as, according to her, the construction is not original (Boëthius 1931, 49). The inner corner in Greenstead has been cut out in a recent building phase. Furthermore, Boëthius discusses the stability of a construction like Hemse with raised timber between a sill and a top plate, without firmly connected corner posts or braces, of which there are no traces. Her conclusion is that there ought to have been inner earth-embedded posts connected to the roof construction through the truss (Boëthius 1931, 121).

The questions about both the stability and the missing parts of the wall staves were elucidated in the early 1970s when an informative imprint of a stave church was discovered in Silte. The imprint in this neighbouring parish seems to be like Cinderella’s shoe to Hemse. In 1971 Harald Olsson was commissioned to conserve the mural paintings in the Romanesque church in Silte. During work on the inner wall in the nave connecting the chancel, he discovered stains from tar with the contour of a possible stave church roof. The hypothesis was that a wooden stave church had been standing while a new stone church was being built.

An excavation of the church foundation



Figs. 9–10. To the left, excavation of the foundation of an earlier stave church in Silte parish. Cut-outs of the vertical timber staves have been positioned to visualize the placement of the staves. Photo: Waldemar Falck, January 1972. ATA. To the right, documentation of the contour line in the nave of the stave church, showing an inclination of approximately 20 cm from the ground to the top plate. SfM documentation by Gunnar Almevik.

was initiated, led by the archaeologist Gustaf Trotzig. The stone church nave was fully excavated and a foundation of a smaller church was uncovered. There were no significant findings of wooden construction material, except for a piece of a wooden roof shingle, but the properties of the foundation were peculiar. Just outside a stone base for the sill there was a gutter about 45 cm deep, and further outside larger boulders, probably to keep the wall in place. The floor was made of planed lime mortar on top of a deep layer of limestone chippings. The mortar floor was placed on a level with the stone base and continued at a level between the nave and chancel.

Through the Silte excavation, the absent part of the staves and the question of stability in Hemse found a plausible explanation. The staves probably clung to the slanting cut in the sill and continued down the gutter in the

ground. The boulders fixed the wall staves in place. The contour of the roof in Silte provides precise information about the roof height and the inclination angle of an absent stave church. In the stain from the roof tar we find no hint of a raised mid section or sectioned roof fall. It is a plain tall raised gable roof.

There are two properties of the find in Silte that are documented but not further discussed. Firstly, the walls have a notable inclination inwards. Our own measurements show that a cross-section of the nave at the level of the sill was about 40 cm wider than the same cross-section up by the top plate. Claus Ahrens depicts the leaning walls in a reconstruction sketch (Ahrens 2001, 219), but what does this do to the appearance of the church? It is obviously intentional and not a matter of decay.

The second perhaps overlooked detail is the traces of a central column. According to

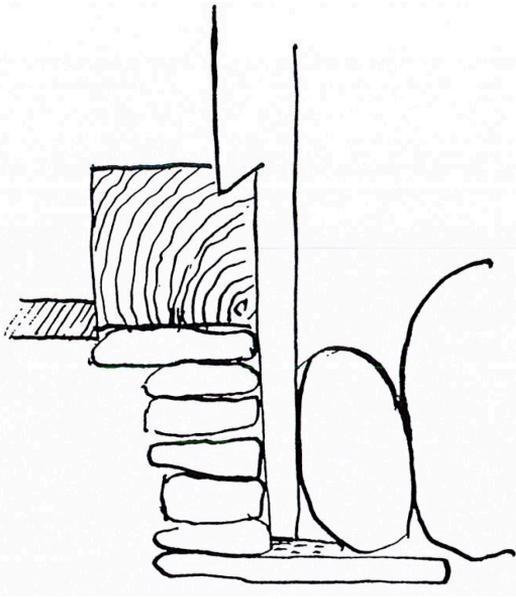


Fig. 11. Gustaf Trotzig's interpretation of the wall staves, jacking the sill and continuing into a gutter (Trotzig 1972, 84).

Gustaf Trotzig's description of the excavation in Silte, there is an earth-embedded post-hole in the former church nave, in centre to the west, 15–20 cm in diameter and 50 cm deep (Trotzig 1972, 75). The post-hole is not depicted on the documentation drawings. This may have been a structural element of the wooden church, as Gerda Boëthius suggests. We know several Gotlandic churches with a central stone column structurally related to the vaults. Wooden central columns also exist in a number of Norwegian stave churches with connection to the roof construction. We discern that this central column is an object of significance.

In the nearby church of Garde yet another stave church was discovered in the Romanesque stone church nave in 1968. The excavation, also led by Gustaf Trotzig, revealed a church plan between thick earth-embedded posts (Trotzig 1970). If these posts carried a ground plate for the wall structure, or if the wall staves had a palisade construction, separated with the roof carrying

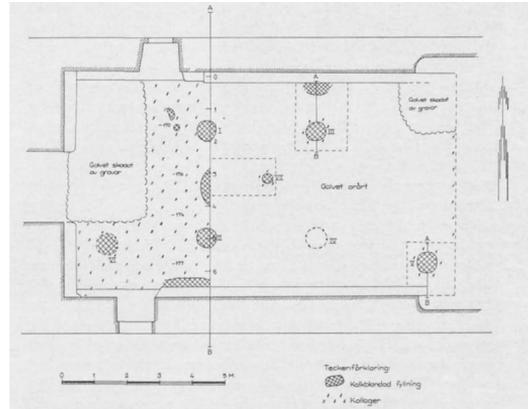


Fig. 12. Garde excavation plan from 1968 (Trotzig 1970, 7) showing the earth-embedded staves, a foundation from a baptismal font and (hole no. VII) a hole from a possible earth-embedded centre column, 30 cm in diameter and 50 cm deep (ibid., 8).

construction, is not possible to attest by the archaeological record. The excavation sheds light on some details of the interior plan: a large foundation of a baptismal font with a drainage arrangement is placed in centre with an offset to the west. In a possible epicentre of the church, behind the basin, there is also a hole from an earth-embedded central wooden column.

Examining 67 pieces of historic wood

Significant parts of Hemse stave church, three decorated pieces from the western portal and seven staves, are used in the reconstructed facade at the National History Museum. Another six staves are used in a wooden lapidarium in the Museum of Gotland. The only preserved stave with a connection joint to the chancel is deposited, unmarked, in the museum storage outside Visby. A carved detail, supposedly a gable end decoration,

is located in the cellar of the main building of the History Museum. The rest of the 40 pieces are located in the Swedish Museum Service's grand store in Tumba. Ten pieces are missing of the presumed 67 items in the History Museum's inventory: eight fragments of staves, a piece of fir wood, and a chancel sill that might never have existed (SHM 10232–5). The two benches that were found during the restoration of Hemse in 1896, hidden as support for other benches, are stored separately from the rest of the stave church material.

All construction parts have been reinvestigated, documented and processed into digital 3D representations through *Structure from Motion* (SfM). Using photogrammetry, SfM computes a three-dimensional structure from a large amount of photos captured systematically (see de Rue *et al.* 2013). The investigation involved a general survey of the surfaces with a tactical flashlight to elicit traces in the wood. Comprehensive measurements were taken but no manual drawings were made. Erik Hansen argues that the manual measurement and documentation drawing is not just a means of representation but a mode of investigation, providing “a dialogue” with the monument (Hansen 2000). On the other hand, the gain with the digital documentation is the opportunity to continually reinvestigate, check, and control data. A manual drawing of an artefact, such as a nine-metre long top plate, may generate about 150 measurements, and a digital documentation through SfM may generate a point cloud containing 32 million measurement points. As representations rich in detail, the digital models eliminate a level of abstraction that drawings introduce. In Ekhoﬀ and Sörlin's work process, the translation from physical artefacts into inscriptions meant a loss of contact with the originals where errors were easily introduced.

The reinvestigation of the remains from Hemse gave new information. Firstly, our



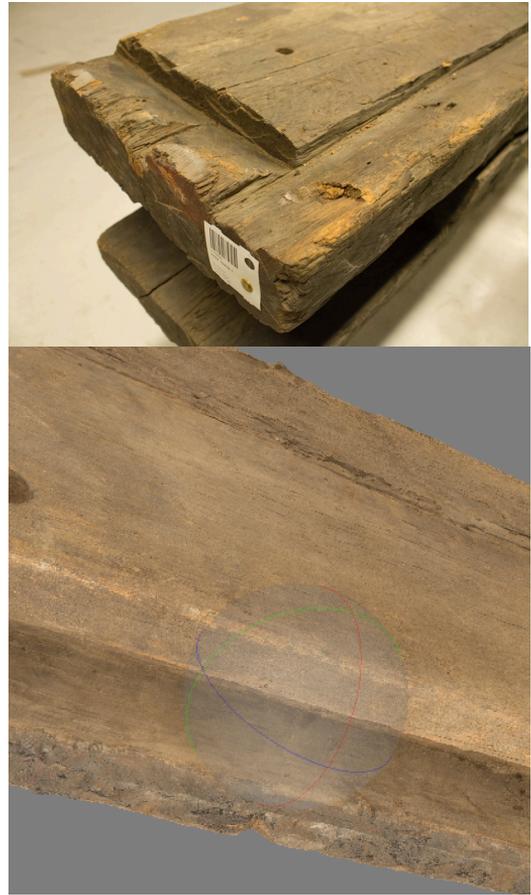
Figs. 13–15. Traces of tool marks indicating a social division of surfaces.

documentation contests core measurements of the stave church published by Ekhoﬀ 1914–16. The inaccurate measurement of the length of the sill has been taken for granted by subsequent researchers. When for instance Erland Lagerlöf and Bengt Stolt compared the church space in Hemse with Eke and Silte they reproduced Ekhoﬀ's errors (Lagerlöf & Stolt 1969, 185; Lagerlöf & Stolt 1974, 465). Secondly, we observe a conscious grading of the wooden surfaces. The hidden surfaces

on the sill are roughly hewn in the peculiar early medieval technique *sprätthuggning* (Fig. 13), while the surfaces close to the human hand are smoothly planed (Fig. 15). Visible construction parts in distant places like the top plate and the roof (there are two parts of possible members of the truss) have a semi-smooth surface carefully hewn with a broad axe (Fig. 14).

Our investigation affirms the critique of Ekhoﬀ's reconstruction using rounded corner staves, which made Hemse resemble Urnes I. Observations that point in another direction might have been overlooked. There is one stave in particular, with a pattern subtly distinguished from all other staves through the inclusion of two instead of one formation of a cross-shape made out of concentric rings, that could be the one located in a corner joint. Unfortunately the sides have been hewn and planed, leaving no trace of the possible corner joint. Furthermore, there are no traces of any windows in the preserved staves. This is however evidence *ex silentio*. Erland Lagerlöf and Bengt Stolt argue that any penetrated staves were unfit as floor tiles and sorted out when reused (Lagerlöf & Stolt 1969). Were there no windows at all? We cannot tell for sure, but we question the habitual interpretation that a building is defined by the property of light through windows. The early Christian religion revolved around the light ritually provided mainly through oil lamps or candles.

The reinvestigation also confirms many of the observations that Ekhoﬀ made. The preserved staves from the inner wall between nave and chancel imply a narrow opening, possibly a doorway as suggested by Ekhoﬀ. The west portal entrance door opened inwards and was mounted on the left side of the inner wall. There are several leads that inform that the building was either repaired, or more probably moved and re-erected. There are traces of both primary wedges and secondary dowels to fix the wall staves in the top plate.



Figs. 16–17. To the left, the groove in the sill to connect the wall staves continues to the end. There are no traces of a corner stave. The small hole may be a secondary nail to hold the pieces together after re-erection. To the right, traces of presumed original method to fasten the wall staves in the top plate with exterior wedges, and secondary skew dowels mounted from the interior.

Imprints in the tar and nail holes along the sides of the staves are a lead to a cover strip between the wall staves, possibly to cover emerging gaps from decay or subsidence.

When Ekhoﬀ published *Svenska stavkyrkor*, remains of wooden churches were known in Guldrupe, Hablingbo and Lye

(Ekhoﬀ 1914–16). Later discoveries have been made in Eke, Alskog, Dalhem, Sproge, Garde and Silte. The primary interpretation potential occurs in dialogue with the later stave church discoveries in Silte and Garde. In light of the findings at these sites we can say that the staves in Hemse were jacked in the sill but continuing down in the earth, giving stability to the construction. Large boulders were placed against the outer walls as support but also with a clear visual effect. The walls leaned inwardly, which we assume is partly due to a thickening of the lower part of the staves. The 4.35 metre inclined palisade-like walls and the steep gable roof, well over seven metres to the ridge, gave the small church a tower-like silhouette. The door, 3.3 metres high and just 80 centimetres wide, intensified the lofty impression, and lent the construction a kind of grandness in spite of its diminutive dimensions in our retrospective lens. The roof was most likely covered with wooden shingles. Evidence of shingles from the 12th century are found in several Gotlandic churches, and

what is notable is their decorative features: the standard shingle is pointed, often with an engraved relief and with a visible iron nail (Utas 2008; Lagerlöf 1978). Another decorative feature is the concentric rings, the same as found in Hemse.

An interactive diorama

The third perspective in this article seeks a dwelling perspective where the results of the research are compiled and graphically presented as an alternative reconstruction to the one Sörling and Ekhoﬀ presented in 1914–16. Using the SfM documentation of the 57 pieces as templates for a digital reconstruction model (Fig. 18), each individual part of the structure has been modelled separately, piece by piece, like a simulation of a real construction process. While the main measurements are taken from the primary material, principles have been derived from analogies to other archaeological material

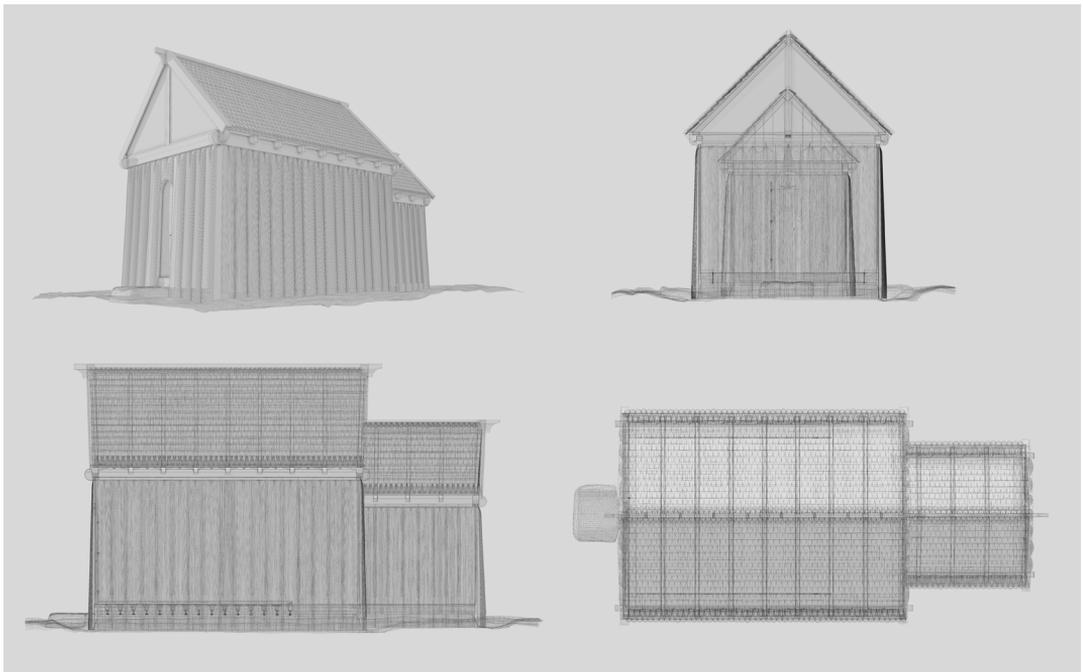


Fig. 18. The digital reconstruction of Hemse Stave Church in Autodesk Maya.

and standing buildings. In this sense we are conjuring up a church in much the same way Ekhoff and Sörling did. However, our analogies are brought closer to the location of Hemse.

The aim of the reconstruction is to provide a visual experience that gives a sense of the stave church as a real place and not just a theoretical space. In addition to accurate construction principles and architectural forms, this also requires paying meticulous attention to textures and light. A critical question in the process of texturing is what stage of the building's life span is to be simulated. The textures are obtained from the archaeological finds and can as such be considered authentic. However, applying them unedited to a digital construction that reconstructs the church as it might have appeared when newly built results in a hybrid representation that brings together both processed and unprocessed data; the digitally reconstructed translation of the wooden remains, and the surfaces of the wooden remains as they appear today.

Such a hybrid is not wrong *per se*, as it constitutes a knowledge model rich in

information, incorporating as it does both hypothetical and factual material. Neither is such a representation uncommon, as most, if not all, physical dioramas that incorporate authentic remains are bound to be made up of materiality from different time periods. However, to arrive at a more accurate simulation of lighting conditions and the appearance of the interior space at a time when the church was in active use, as a place of worship, we edited the textures obtained from the archaeological finds. This was intended to give them – and in the process also the simulated stave church – a less weathered appearance.

To build our simulation of this space, and make it into a place, we assembled the model in Unity, a visualization engine by Unity Technologies that also functions as an archive for heterogeneous digital material. Sound recordings, 3D models, photographs, and drawings can here be arranged in an interactive scene. Organized as a place, the interactive virtual reality scene resembles in principle a traditional museum diorama. The diorama is a setting in which artefacts or specimens are



Fig. 19. The textured model assembled in Unity.

mixed with artificial constructions and matte painting to create a scene that communicates to a context within the confinements of a display. Hemse stave church has itself been part of a museum diorama, then as a backdrop to an arrangement of early medieval artefacts and produced to contextualize their relations in a church space. In our use, a virtual diorama is a technique by which to contextualize an artefact or milieu by bringing it together with digital representations or reconstructions of materiality that have been spread out in both time and space (Westin & Almevik 2017).

Working with photorealistic and immersive environments requires an understanding that such visualizations are easily read as complete (Westin 2014). The empty spaces created from missing materiality, left out of the scene due to uncertainty or lack of information, become equally defining parts of the scene as the materiality included. Hence, there is a conflict between the desire to create a well researched space only referencing what we know, and the desire to create a place realistic

in its composition and appearance, albeit more hypothetical. In an effort to put the focus on the structure of the stave church, in our interactive scene we have opted for an empty and featureless landscape, with low non-descript vegetation. The light in the scene simulates a clear day at the beginning of March, around three in the afternoon. These light conditions are chosen to offer a well-lit exposition of both the west and south facades. However, we are aware that the composition of this scene is in no way neutral, and may lead to faulty assumptions about the structure's relation to a built environment and the surrounding landscape, as well as communicating a problematic idealized image of the structure's appearance.

While the inside of the stave church constitutes a confined space, when one approaches it as a liveable place it opens up to an even larger number of interpretations and uncertainties. In the confined space of the church interiors we are able to simulate several aspects that make it into a place. In

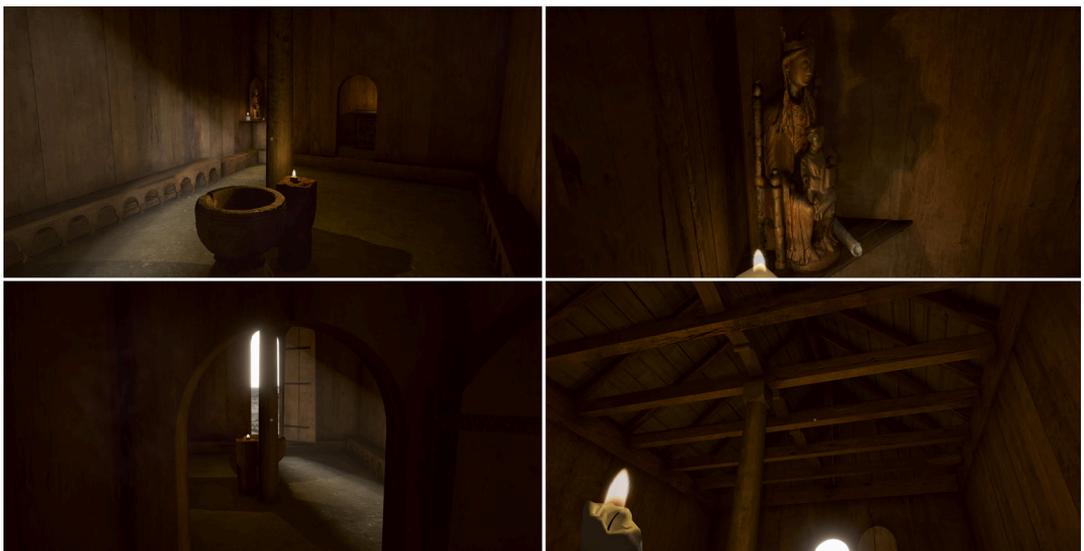


Fig. 20. The highly polished figurine in the shrine, here represented by the Appuna madonna, glistens as it reflects the light of the oil lamps; the reliefs of the font deepen and the water reflects the light upon walls and ceiling. Shadows, all moving from the flickering lights, become part of the dwelling; the carried light makes the roof truss and rafters come alive as we move through the nave, and the shadows cast by the font and the central column stretch out before us, tracing the outlines of the room.

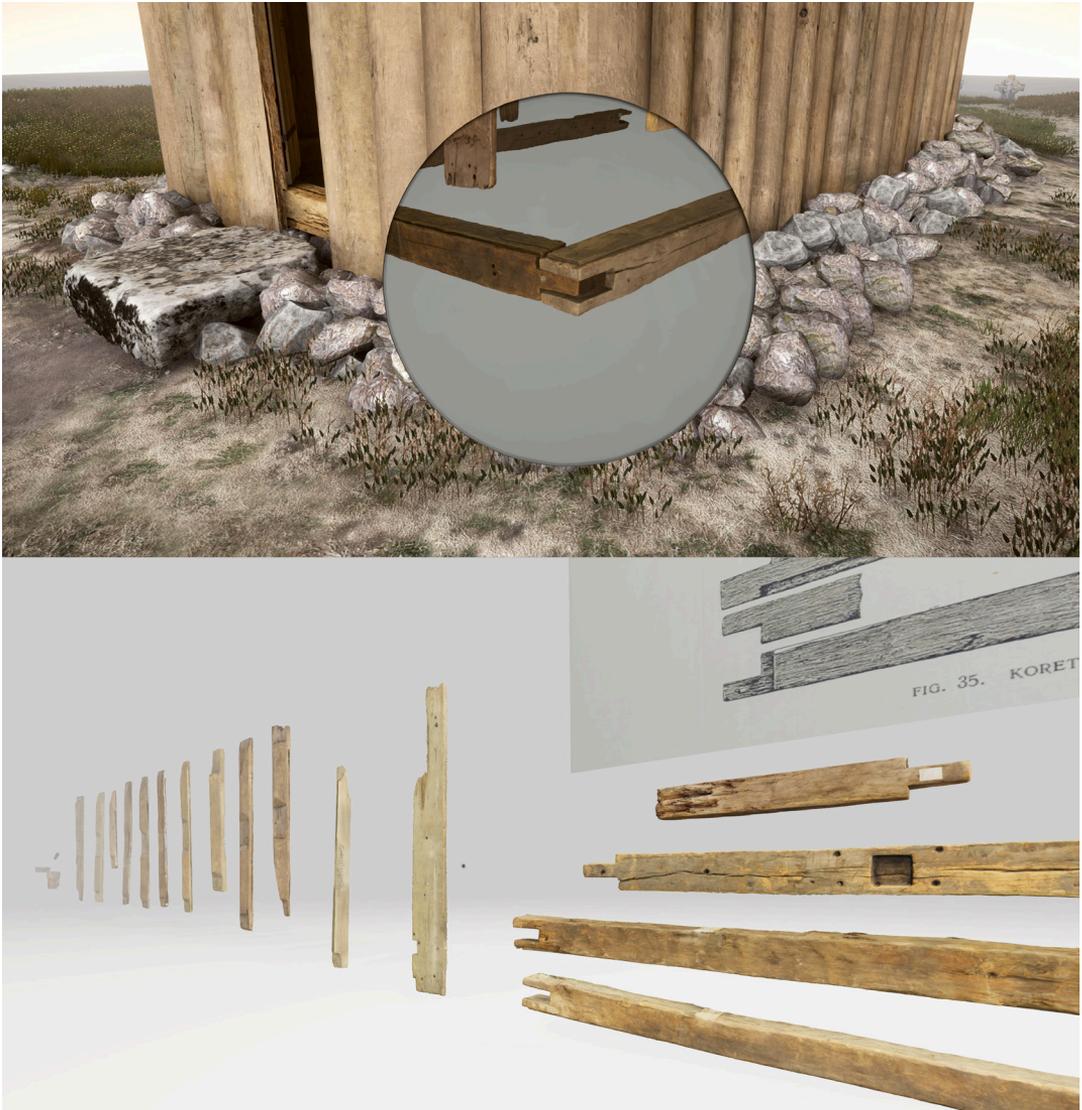


Fig. 21. The simulation offers opportunities to deconstruct the reconstruction and hold it accountable to the source material.

our simulation we start with only two light sources: the piercing daylight coming through the high door opening, and the much more discreet light of the small window in the chancel. In addition to these, three stationary artificial light sources simulating oil lamps are available. These invite a focus on three important nodes in the nave and chancel – the font, the shrine, and the chancel altar table – and they can independently be extinguished

or lit. Finally, there is the possibility to light a fourth oil lamp, this one carried by the person moving through the rooms. By being able to manipulate light sources, their effects on the architectural space become apparent, but also their importance for the reception and uses of the artefacts.

As the light and shadow play are such prominent aspects of the interior space as a place, interpretations of the architectural

structure and the furnishing gain an even greater importance as these have a profound effect on the lighting conditions: lime-washed walls reflect the light differently from uncoated fir wood, and different interpretations of the roof framework of trusses and rafters would pick up the light in different ways. Furthermore, the addition of windows in the south facade, as Ekhoﬀ proposes, would dilute some of the controlled – for the liturgy possibly essential – effects the oil lamps offer.

Hence, the simulation of the interior offers a space to try out different aspects of what makes this space into a place, and lets us experience it as a real room. It is as a place, where artefacts, order, character, light, and time all come together, that the effects of the central column as a room divider can be experienced and analysed. The font and other artefacts can here be assessed in relation to a room, their scale finally regaining context. Moreover, being a complete model of the stave church carrying both interior and exterior properties combined into a whole, we get to simulate how these interact. This means that we can experiment with effects of the sunlight on the interior space and see how windows and openings filter the outside world.

From reconstruction to simulation

At the National History Museum's exposition, by the wall-mounted stave church facade with original parts from Hemse, there is a sign that informs the visitor:

The earliest churches, such as the 11th-century stave church in Hemse, were built of wood. Often they were built for a magnate, on his own estate. During the 12th century an ecclesiastical organization took shape, with a church in every parish and a cathedral in every diocese. Churches

now began to be built of stone instead of wood.

Cultural-historical interpretation cannot convey the meanings of this building, beyond this rather poor narrative. We may assume that the early Gotlandic stave churches were commissioned by magnates and used within a family or close community (Andrén 2009). Gunnar Smedberg interprets through provincial laws that a process of communalization of the churches was initiated during the late 12th century with the formation of parishes and the church's development and defence of a tax system (Smedberg 1973). Hemse, which is dated by dendrochronological analysis to 1145 (Bartholin 1998a,b), may have been a magnate's church, which during its life course was used or reused as a parish church. However, these scholarly narratives are concealed beyond and beneath the historic wood of Hemse. What more could we retrieve from this old archaeological material?

In this article we have pursued Emil Ekhoﬀ and Olof Sörling through published texts and archival records. We may conclude that this one single building provides a large amount of data that they, at the time and with the means at their disposal, had difficulties seeing through, and furthermore, that their interpretation was embedded in a discourse of its time. Historical knowledge is, to quote Robin George Collingwood, "the re-enactment of a past thought encapsulated in a context of present thoughts" (Collingwood 1999). We have revealed that the thoughts of Hemse intersected with the prestige and claim of the stave church brand. The appearance of Hemse in the reconstruction drawing of Sörling and Ekhoﬀ is tainted by the discourse of its time. The Norwegian connections are visualized by Urnes round corner staves and decorated west gable and Hopperstad's location of the gable end decoration. In succeeding research

Hemse was assigned to a transitional type of stave church, as a link between the archaic palisade churches of Lund and the Norwegian stave churches proper.

From a forensic perspective we have re-examined the historic wood from Hemse and interrogated the accumulated sources for Gotlandic stave churches, and presented an alternative reconstruction model of the stave church. The model shows the construction and architecture of both exterior and interior space. We may point at the various elements of the model, and argue for the visualized properties, one by one through primary sources or contextual analogies. The investigation also informs about events in the life course of the building, that it has been extensively repaired or moved and re-erected.

The interactive model provides the possibility for a dwelling perspective. The forensic investigation and reconstruction may give the artefacts a presence effect, which connects cultural-historical interpretations to the effect of historic artefacts on our bodies and senses. The archaic appearance of a palisade church, with earth-bound wall staves fixed with stone boulders, although in a construction with sill and top plate frames, seems like an “iteration” in conceptualizing a church building (Derrida 1971). The sill may have been a new constructive element but it was not integrated in the aesthetic concept. Furthermore, the small church gives the impression of a kind of grandeur, with the inclination of the facades, the steep roof and the tall western portal. The main light in the small church space, with a nave less than 40 square metres, came from the main door. The centre column that is proposed is not interpreted as a secondary support, rather a primary constructive element and a distinguished social actant. The column creates a network with the font, the side benches and the shrines. The column creates a frontline, a place before and beyond, and two

sides where the visitor has to choose one.

The interactive model of Hemse presented in this research is not a definitive reconstruction with inviolable properties. The interactive technology provides a means to present the alternatives and the ambiguities as well. Reconstructing Hemse is the active part of what Favro calls a knowledge representation (Favro 2006): a process of knowledge acquisition and evaluation that manifests itself in a reconstruction. Hence, the process of extracting information from a model being developed constitutes knowledge acquisition by itself (Murteira *et al.* 2017). Moreover, as Silberman writes, reconstruction “is not a conservation approach but an engagement approach that can help reconnect people with place, history, and landscape” (Silberman 2015, 5). As such, the reconstruction is less of a static representation of our knowledge than a simulation or a research laboratory through which hypotheses can be tested and both researchers and the public can be engaged in a dialogue.

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