



Building the Temple of Salomo in the Early Medieval „Alamannia“

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The diocese of Constance is one of the largest north of the Alps, reaching from the Lakes of Thun and Brienz down to Stuttgart and Ulm, from the river Iller (passing Kempten) to the Rhine near Lörrach and Freiburg. Its origins date back to the end of the 6th century; when saint Gall came to the duke of Alamannia, Gunzo, around the year 613, the duke promised him the episcopate, if he would cure his daughter.ⁱ In the 9th century some of the bishops also were abbots of the monasteries on the Island Reichenau and of Saint Gall. Three of the bishops were called Salomon, one being the uncle of the following.ⁱⁱ The noble family they belonged to is not known, but they possessed land on the southern shore of Lake Constance, in the province of Thurgau. Salomon III. was educated in the monastery of Saint Gall, and prepared especially for the episcopate. Maybe his uncle and granduncle also benefitted from such an education. Even their predecessor, bishop Wolfleoz, started his career as monk in Saint Gall. It is likely that the three Salomons were given their names with the wish, that they once would gain this office. Bishop Wolfleoz agreed to grant the monastery great privileges, so it became more independent from the see of Constance. At this time, 830-837 Abbot Gozbert built a new church and monastery, for which purpose his colleague, Abbot Heito from Reichenau, drew the wellknown „plan of Saint Gall“.ⁱⁱⁱ The heart of the depicted monastery was a 300-feet-long three aisled church with two apses on their opposite ends, a great transept at the eastern end and two towers in front of the western apse. But abbot Gozbert decided to build another church: only 200 feet long and 100 feet wide (59,40 x 29,70 m), with no apse at any end and no transept, as the excavations beneath the floor of the baroque minster in the years 1964-66 showed (figure 1). An inscription on the plan of Saint Gall tells us, that the church should be 200 feet long, exactly as long as the excavated foundations were, the „inner temple“ (main nave) being 40 feet wide and the aisles being 20 feet wide, the whole building hence measuring 80 feet. The nave of the really built church was 50 feet wide, including the arcades, with aisles being 25 feet wide.^{iv}

The contradiction between the drawn length of the church (300 feet) and the inscription, saying, the church had to be 200 feet long, puzzled the scientists for a long time.^v Instead of scaling down the drawing of the church, they should have read the bible: the prophete Ezechiel describes the temple in his vision as being 100 yards long and 40 yards wide, standing on a substructure being 50 yards wide (Ez. 41). If one yard corresponds to two feet (59 cm), one gets the width of the church, as written on the plan of Saint Gall and built in reality: 200 x 100 feet. The „inner temple“ is 20 yards wide (= 40 feet), the temple wall and the chambers around it measuring 10 yards = 20 feet, corresponding to the aisles of the church. Ezechiel describes the celestial Jerusalem as he thought it should be, after the temple had been destroyed by the Babylonians. Its measurement corresponds to the temple of Salomo, as described in the first book of Kings, chapter 6. Therefore abbot Gozbert should have been named the real Salomo. Instead, exactly when the new church of Saint Gall was built, the first of the bishops named Salomo enjoyed school in the monastery. He must have been born ten years earlier, when the „plan of Saint Gall“ was sketched. This coincide elucidates the long discussion about the symbolic meaning of the new church of Gozbert: it was the attempt to reconstruct the temple of Salomo with the material, a monastery of the 9th century can grasp at. Even in the minster of Aachen an inscription tells us, that „this is the temple of Salomo“ - confusing the temple described in the bible with the building, medieval pilgrims saw in Jerusalem: The octogonal dome of the rock. Until early modern times this mistake dominates the images of the holy city.^{vi}

Although the scheme of squares, which determines the placement of important walls in the church, discovered by Hans Rudolf Sennhauser, seem to explain the construction of the building, there was some mystery left.

The foundation wall, which separates the choir from the nave, was not situated in the middle of the church, but some distance east to it, leaving as much room, as was needed for the tunnels, which lead to the crypt with the remains of Saint Gall; although it was not planned to built the tunnel all around the choir. The middle of the church was marked by four columns, probably standing below a scale leading up to the choir. They seem to have held a rood-loft (pulpitum). In the aisles small scales leaded down to the crypt. The tunnels beside the choir characterize it as a square platform, set into the church, 40 x 40 yards wide (80 x 80 feet), corresponding to the width of the temple above the foundational platform, as described by Ezechiel. The inner width of the nave of about 12,70 metres corresponds to the width of the temple rooms of 20 yards: A yard used for measuring wool in the city of Saint Gall was 61,09 cm long, 20 yards matching 12,21 m.^{vii} On the other hand, the length of the nave of about 31,40 m does not fit to this scheme (it corresponds to 51 yards, not 40 yards as it should be). For linen, another measure was used in Saint Gall: a yard of 73,54 cm; 40 yards amount to 29,42 m, 1,98 m less than required, but roughly corresponding to the suggested inner width of the arcades. 20 yards fit to the width of the nave, including the arcades (14,71 m, exact width: 14,85 m). So the distinct measures seem to correlate to different methods of measuring the dimensions of the „temple“.

A trapezoid plate in the groundfloor above the grave of Saint Gall maybe refers to another scheme, based on equal-sided triangles (although its opposite sides don't exactly stand in the angle of 60° to each other, figure 2). These triangles were used to receive exact rectangles with a simple string, divided by knots into twelve equal sections, for example by sticking up two homologous triangles on a line or reflecting a triangle on its altitude.^{viii} The first method can be reconstructed in the nave of the minster: The triangle between the grave of Saint Gall and the foundation wall between the nave and the choir fits two times into the interval between the mentioned foundation wall and the western wall of the church. A triangle two times as large fits to the width of the whole church (with its altitude), reaching from the western wall to the foundation wall between the nave and the choir (with its baseline). The altitude correlates to 20 yards used for linen in Saint Gall (14,71 m). Another small triangle reaches to the western wall of a building in front of the church, later called the „Helmet house“, because the helmets of noblemen, who had been buried there, were displayed on the walls.

How looked the church like inside? In the early 20th century the architect August Hardegger tried to reconstruct the carolingian church, starting with the plans, made in the early 18th century, when the monks started to think about the renovation of the old monastery.^{ix} He stepped back in time, compiling the bills for building expenses and notices about changes in the structure of the church. The main sketch, he depended on, was drawn by Gabriel Hecht in 1724 (figure 3). But Hecht made some mistakes: The aisles in his ground plan were too broad, and the wall between the nave and the choir was placed too far to the east. So the pillars of the presbytery, which belong to a perpendicular phase of the church (1439-1483), stand too close to each other. Hardegger also did not know, that the carolingian church looked very different to the famous plan of the monastery, drawn on the island of Reichenau. So he suggested, that the columns of the carolingian church stood right there, where the pillars of the church of the early 18th century were placed. But they probably did not: in 937, 1314 and 1418 fires devastated the monastery, and in 1623 the church was elongated to the west, adding three arcades and columns.^x Already in 1034 the minster was „enlarged“, but Hardegger had no idea, in which direction.^{xi} A plan of the city of Saint Gall, drawn by Melchior Frank in 1596 shows the upper wall of the nave from the south (figure 4). The windows were circular, like in the church of Schienon on the peninsula of Hõri at the west end of the Lake. Also the destroyed churches of Allensbach, the parish church St. Nikolaus in Petershausen and the minster in Reichenau-Mittelzell had such windows, dating to the late 10th until the early 12th centuries.^{xii} Obviously the church of Saint Gall was renovated in the 1030s, using the old foundations, but in a „modern“ style. In addition to this, maybe the church of Saint Othmar, built in 867, originally reached unto the façade of the main church, and in 1034 the „Helmhaus“ was built, with the chapel of Saint Michel in the first floor, opened to the nave by arcades. The „enlargement“ of the main church would therefore be done to the disadvantage of Saint Othmar's church. This theory can be supported by the observation, that the reconstructed original saint Othmar's church would be exactly twice as long, as it was wide, and only a little bit larger than half of Saint Gall's church, therefore being a smaller adherent of Saint Gall (figure 2). The crypt was constructed, using a star of David, with its centre at the centre of the western square in the church, and the triangle's base being as wide as the church is.^{xiii} Also in 1623 the old columns of the nave surely had to be removed, otherwise the width of the arcades would have been irregular. P. Gabriel Hecht depicted the pillars with equal distance, but we don't know, if this was phantasy anyway: He also added chapels outside along the aisles, like at the cathedral of Constance, which never existed.

The northern entry to the church corresponds with the entrance to the cathedral of Constance, and also the wrong proportions of the nave and the aisles can be explained by copying a plan thereof: If one enlarges the groundplan of Constance Cathedral by 116%, it nearly perfectly suits to the new plan of Saint Gall (figure 3).^{xiv}

Also the perpendicular pillars in the choir surely did not stand at the place of their predecessors, because the high arcades, reaching to the top of the vault of the central nave, necessarily were broader than the carolingian arcades, opening to narrow aisles on both sides. Additionally, in the foundations of the perpendicular pillars some capitals of Gozbert's church were recovered: seven magnificent corinthian capitals of columns, but also square capitals for pillars. Maybe two pillars faced each other, because the capitals correspond in their design. But on the foundation walls, which were excavated by H. R. Sennhauser, no indications seem to be found, where and what kind of columns or pillars stood on them. August Hardegger and Rudolf Sennhauser suggested, that the arcades only rested on columns (just the easternmost arcade equipped with pillars). Guido Faccani put square pillars to the east of the arcades as well in the nave as in the choir, at the end of a row of five respectively three columns.^{xv} But the alteration of columns and pillars is typical for romanesque architecture, especially in northern Germany, for example in Hildesheim. In the cathedral and St. Michel's church in Hildesheim two columns and one pillar succeed each other.^{xvi} There are three groups of columns in the nave of Saint Michel's church. Also the church of Corvey may have had alternating columns and pillars: Probably the church of the former monastery of Bursfelde ca. 30 kilometres southeast of Höxter at the river Weser was a schematic copy of the carolingian church of Corvey, because the monastery was settled by monks from there.^{xvii} The size of the church is similar to that of Corvey. In the nave two columns alternate with one pillar; in the choir narrow arcades are placed on high walls between the nave and the aisles. In south western Germany and northern Switzerland many romanesque churches have only columns in their naves, and only the easternmost arcades rest on pillars.^{xviii} This arrangement is typical for the churches of the so called „Hirsau Type“: the eastern arcade of the nave already belongs to the choir, representing the „chorus minor“, where sick and elderly monks stay during the service.^{xix} But this arcade is separated from the aisle by transversal arcades, with corresponding foundations in the ground. In Saint Gall none of such foundations were documented by the excavations.

The prototype for this choir was the late antique cathedral of Constantine and Valentinian in Trier, which was rebuilt in the 10th century, after a devastation by vikings in the late 9th century.^{xx} The crossing originally rested on four large columns, which then were embedded in cross-shaped pillars; one of the columns broke down before it could be strengthened, together with the spire. The nave was framed by arcades of five pillars on each side (between the choir and the porch). In the 10th century Trier gained much importance in the Ottonian empire, because the monastery of Saint Mauritius in Magdeburg was staffed by the monastery of St. Maximin in Trier. When the church of Saint Gall was built, the monastery of Corvey was one of the most important building projects in the carolingian empire. The monastery was founded in 822, and its ground plan was a combination of an antique *castrum*, as described by the so-called Pseudo-Hygin, and the temple of Ezechiel. If we accept an alteration of columns and pillars similar to its church, in Saint Gall's church would be place for two groups of three columns in the nave and one group of three columns in the choir, leaving some place for rectangular „apses“ to the east. The square cushions reused in the foundations of the perpendicular choir may be separated the nave from the presbytery. The arcades in the choir reach to the top of the triangle then, leaving enough place for a scale up to the choir above the crypt (H. R. Sennhauser suggested, that the scales to the choir were nearly situated at the eastern end of the presbytery, which looks quite strange). The floor above the tunnels below the aisles didn't need to be as high as the floor above the vault of the main room of the crypt, so there were two levels in the presbytery. Maybe this arrangement was copied in the church of Saint George on the island of Reichenau, built before the year 896 by Heito, abbot of Reichenau and archbishop of Mainz.^{xxi} Adolf Zettler suggested, that there originally were three columns in the arcades, followed by a pillar to the west (figure 5).^{xxii} A very narrow cleft separates the pillar from the western wall of the church. The apse with the entrance was dated to the years 925-945 by dendrochronology.^{xxiii} The construction method with the equal-sided triangles shows, that the pillars stand on the line, which touches the edge of the triangle in the nave, with another triangle to the west, where later an apse and a porch was built. The crossing is half as wide as the altitude of the triangles, proving that the ground plan was exactly constructed with these triangles. Probably, it was planned to build the nave double as long as it is today, but this project was not executed. The arcades then would consist of six columns and one pillar in the middle.

The arches are a little bit smaller than the arcades between the nave and the aisles in Saint Gall, but they cover exactly the same distance as in the church of Saint Gall between the suggested pillar in the middle of the nave and the four columns, which supported the rood-loft. If the ground plan of Oberzell is brought to a scale, where the arcades fit to the arcades suggested for Saint Gall (119% of natural scale), both crypts nearly have the same size. The church of Oberzell would be roughly as wide as the central foundation square inside the tunnels to the crypt of Saint Gall, the choir reaching to the rear side of this square. Therefore maybe connections in the measurement of both churches exist.

Also the copying of the cathedral of Constance by the monks of Saint Gall in the 18th century may already happened in the past: The crypt of Saint Gall is very similar to that of the cathedral, not only in regard to the number of columns (there were four columns in the crypt, before adding two columns to the west), but also the dimensions are the same. The crypt of the cathedral of Constance is dated to the 10th and 11th century, but it contains relicts of an elder building.^{xxiv} East to the minster the excavations brought into light the foundations of a circular chapel, like that of Saint Mauritius east to the cathedral of Constance, even at the same place: it did not stand in the middle axis of the church, but north of it. This chapel was a copy of the Holy Grave in Jerusalem, built after the year 955 by bishop Konrad (934-975).^{xxv} If we copy a plan of the cathedral onto the plan of the church of Saint Gall, with the nave having the same width, the size of the choir is also nearly the same (figure 6). We don't know, how long the nave of the cathedral was before the renovation after it collapsed in 1052. Maybe it was much shorter, like that of Saint Gall. One can see in the combined ground plan, that the place of the columns in Konstanz fits very well to the length of the nave in Saint Gall: there is room for exactly six arcades. But in the church of Saint Gall each arcade would be more than 5 m wide, or 18 feet; the proposed width in the plan of Saint Gall was 12 feet. So there must have been more columns in Saint Gall, or, as suggested, six columns and one pillar; each arcade would be 13 feet wide then (measured from the midth of the columns). The arcades of Reichenau-Oberzell seem to have the width of 3,17 m or 11 feet of 28,8 cm.

Some decades earlier bishop Lambert (995-1018) added the transept to the cathedral; before this the choir must also have looked quite similar to that of Saint Gall. Maybe the original plan of the cathedral is preserved by the plan of the church of Saint Gregor in Petershausen, a suburb of Constance on the other side of the Rhine.^{xxvi} The church was destroyed in the 19th century, and only the front gate survived. Old pictures and plans tell us how the church looked like. The reconstructed ground plan is similar to that of Saint Gall, even the relative length of the nave (figure 7). But the church of Petershausen is much smaller, being just 62,5% as large as that of Saint Gall (5/8) and 72% in comparison to the cathedral. The church of Petershausen, built by bishop Gebhard II., the holy, and dedicated in 992, was destroyed by fire in the middle of the 12th century, but maybe it was rebuilt on the old foundations. It had a transept, which did not exceed the outer walls of the aisles, and five columns on each side of the nave, the easternmost arcade being divided by steps from the western part, like the „chorus minor“ in the Hirsau-type churches. The nave is roughly two times as long as the presbytery. Two triangles fit into the arcades, the one to the east exactly placed on the middle axis of the church. Their sides are 11,9 m long, corresponding to 40 feet of 29,75 cm or 20 yards of 59,5 cm. So Petershausen fits better to the temple-scheme than the church of Saint Gall does. There originally were no arches between the nave and the transept or the choir, as described in the Vita Gebhardi. The choir maybe first consisted only of the central nave without the aisles, which were added by bishop Theoderich in 1092 and 1093. The rectangular „apse“ east to the crossing is (relatively) as large as the suggested „apse“ in the church of Saint Gall, being roughly half as wide as the apse in Saint Peter's. The Tympanon of the eastern entrance (the choir was situated at the western end, like at Saint Peter's in Rome) cites a scene of the bronze doors in the cathedral of Hildesheim: the resurrected Jesus opens the door of paradise („noli me tangere“), remembering the „closed gate“ behind the temple, where Christ is expected to come through (Ezechiel 44, 1-3).^{xxvii}

When we accept the theory of a close connection between the church of Saint Gall and the cathedral of Constance, before its plan was changed in the 11th century, it would be interesting to know, which of the churches is older, and which copied the other one. The church of Saint Gall is a little bit larger, so it may be younger, because it is not probable, that the bishop would build a smaller cathedral than the church of a subordinated monastery. The larger dimensions of the church of Saint Gall can be explained by a „biblical measure“: Ezechiel notes, that the angel who showed him the temple used a yard, which was a handbreadth longer than the usual yard. If we suppose, that a yard is equivalent to two feet (0,58 m), a „holy yard“ would measure ca. 0,68 m or 117% of a „normal“ yard.

Because the church of Saint Gall is 116% as large as the cathedral of Constance, it may be a copy, where „normal“ yards were transformed into „holy“ yards (also the smaller dimensions of the church of Oberzell can be explained by this calculation). Only the crypt was copied in the same size. But then the cathedral of Constance must have looked very similar to the church of Saint Gall, being the first try to build the temple of Salomo in early medieval forms, maybe around the year 820, shortly after the great Synode of Aachen, where the constitution of monastic communities was discussed.

Salomon III. founded a church and guest house opposite to the church of Saint Gall, where he could stay for the night, when he visits the monastery. Three monks and three priests served there, representing the cooperation between the two different institutions in the church since the synode of Aachen: the monks, who live in the closed monastery, only serving god by adoration, and the priests, serving god in the „normal“ world outside, with close contact to the laymen. The church was dedicated to the holy cross and therefore shaped cross-like, but more importance gained the relics of Saint Magnus, a former monk of Saint Gall, buried in Füssen; after him the church later was called Saint Mangen.^{xxviii} The example shows, that the visits of the bishop in the monastery of Saint Gall received an elaborate course in the later 9th century. Old chronicles also report, that Salomon I. or III. founded a collegiate church in Bischofszell, half way between Constance and Saint Gall, suitable as base for the voyages of the bishop.^{xxix} The early medieval foundations of the church were excavated by H. R. Sennhauser.^{xxx} It was a three aisled building with no transept and a short choir with one apse to the east (figure 8). The nave was 8,25 m broad, or 20 „short yards“ of one foot plus one handbreadth (41,25 cm). The nave was a little to long (18,6 m or 44,2 „short yards“, instead of 40 yards), and the choir was too short (6,8 m or 16,5 „short yards“), but together the length nearly fits to the biblical proportions, a total of 26 m correlating to 63 „short yards“. Maybe the eastern part of the nave was marked as „chorus minor“ by steps or a fence, which left no traces in the ground. The proportions can be explained by the method of constructing an exact rectangular contour of the building with the twelve-knot-string, described above: two triangles fit into the nave, with their tops together in the middle. This figure was more common in the middle ages than that of the „lying“ triangle, used at Saint Gall (and also in Saint Michel's in Hildesheim). A third triangle maybe pointed to the place of the altar, like that in Saint Gall, pointing to the head of the grave of Saint Gall. In Bischofszell another, obverse triangle was placed upon it, so one gets a six-pointed star, whose central area defines the length of the choir. The star of David is a symbol of god and Christ.^{xxxi} If we copy the plan of the church Saint Gall onto the plan of the church of Bischofszell, reducing it to 65% (ca. 2/3), the nave has the same width, the nave of Saint Gall being a little bit longer, but the choir about double as long as that of Bischofszell. This can be explained by the suggested partitioning of the choir in a rectangular (or semicircular) apse to the east (like in Bischofszell), above the crypt, and a room between the apse and the nave, opened by arcades to the aisles. In Bischofszell, the choir is long enough to insert two arcades of 3,1 m or 10,5 feet, and the nave for 6 arcades. The width of the arcades was surely not reduced to 2/3 of that in Saint Gall, because they would be too narrow. The pillar in the middle correlates to the tops of the two triangles, used for constructing the outline of the nave.

The church of Bischofszell was placed in the centre of a graveyard, whose boundaries still can be imagined by the houses to the north and the west of the church (figure 9).^{xxxii} To the east, it was delimited by the Tuchgasse (a moat is said to be running there in former times), and to the south by a court, called the Freihof (meaning a privileged court) and the house for the morning mass priest. In the northeastern corner the chapel of Saint Michel's is placed, dedicated to the guide of the souls into paradise (which was thought to be towards the east). If we suggest, that the houses to the north were built onto the boundary wall of the graveyard, running straight through the middle axis of the houses, a square yard of 83 x 83 m can be reconstructed. The middle axis of this square is placed at the boundary between the nave and the choir of the church, running north through the passage leading to the parish court at the northern end of the town. Beside this passage the old school house and the office or administration house were placed. The width of the yard is ten times as wide as the nave and therefore measures two hundred „small yards“ of 41,5 cm. The northern end of the parish court was built out on the slope of the mountain, the town is placed upon, 105,5 m north of the middle axis of the church, or about 254 „small yards“ away. The outer wall of the temple area described by Ezechiel was 500 yards wide from edge to edge, so they obviously tried to imagine this building. The corners of the parish court, the court of the clergyman and of a collegiate court to the west nearly cover a rectangle of 83 x 41 m along the Schottengasse (Schattengasse). To the south, the steep slope of the mountain was an obstacle to this endeavour, but the outer wall of the castle to the west also was extended to a distance of about 105 metres from the middle axis of the church.

The castle fills a square of 42 x 48 m, only the northeastern edge being cut off for a passage between the graveyard and the castle moat; it nearly exactly covers a quarter of the graveyard.^{xxxiii} The northwestern edge of the city reaches out ca. 36 m from the castle to the north, so the western front altogether measures 84 m. To the east, the market place is situated in the front of the imaginary outer boundary of the temple area, running parallel to the suggested line, with the houses standing in front of it like those along the graveyard. Albert Knoepfli ascribed the foundation of the town to bishop Eberhard (1248-1274).^{xxxiv} The city hall later represented the counterpart of the castle, standing at the same line through the church. The main front of the whole ensemble was facing north, where the bishop comes from, travelling from Constance to Saint Gall. The topography of this „temple“, placed on the top of a hill, is in exact accordance with the vision of Ezechiel 40,2.

An ensemble very similar to the graveyard of Bischofszell can be found at Radolfzell on the northwestern shore of Lake Constance. East and south of the church the houses are arranged in an edge like on the northern and eastern walls of the graveyard in Bischofszell (figure 10). Christoph Stadler discovered a massive wall, running through the middle axis of these houses, marking the inner border of the collegiate area of Radolfzell.^{xxxv} The collegiate church was founded by bishop Radolt of Verona, who wanted to live the last years before he died in the land he came from. The abbot of Reichenau refused to accommodate him in the monastery of Niederzell, but he gave him the court at Radolfzell to foundate a collegiate church there, at about 826-830 A.D, at the same time, when the new church in Saint Gall was built.^{xxxvi} Christoph Stadler dated the wall in the houses around the church in pre-13th century-times; the masonry resembles the stonework in the early medieval monastery of Mittelzell on the Reichenau.^{xxxvii} The foundations of a great collegiate building, which stood between these houses and the church, were destroyed when the street was renovated in 1989.^{xxxviii} In the church no early medieval foundation walls were found, but to the east a chapel, dedicated to Mary, could be detected, which was demolished in 1436.^{xxxix} In 2017 a piece of stone with a typical decoration of carolingian churches in northern Italy was found in a waste pit at the northwestern end of the city, near the former lower gate (Untertor), below the high medieval defence ditch.^{xl} It shows a three-leafed branch, once belonging to a longer tendril. Maybe it was the ornament of a graveplate or rood-loft, like in Vicenza (graveplate at Santi Felice e Fortunato), Caldogeno, San Michele (lintel), Sesto al Reghena (grave of Anastasia) or in Split (chapel of St. Martin).^{xli} In Stein am Rhein, where the Rhine leaves the Lake of Constance, a golden cross was found in a children's grave, with such a three-leafed branch in the centre, dating into the 7th century.^{xlii} It was excavated in the late roman castle of Burg (Tasgetium) on the southern shore of the river. The monastery on the northern shore was first founded on the top of the Hohentwiel, a former volcano at the western end of Lake Constance and early medieval residence of the dukes of Alamannia.^{xliii} In the early 11th century it was transferred to Stein am Rhein, maybe copying the monastery of Petershausen, which is situated in the same relation to the old city centre of Constance. The pit near the lower city gate in Radolfzell was surrounded by postholes and maybe pits used for weaving, as a spinning whirl made of chalk and a broken piece of a weaving weight prove. Charcoal of an oven allowed a radiocarbon-dating around the year 1000 A.D. This epoch was a „dark age“ in the history of Radolfzell before, because no documents exist, which enlighten the time after Radolt of Verona founded the collegiate until the year 1100, when a market privilege was granted to the abbot of Reichenau for the village of Radolfzell.^{xliv} This privilege is not preserved in original, but a copy in a book in the parsonage, which was discovered in 1888. But it was issued with permission of emperor Henry III., who died in 1056, and therefore Christoph Stadler suggested, that the writer of the book made a mistake, and the lost original privilege was issued in 1055.^{xlv} However, the excavations show, that the settlement reached the boundaries of the high medieval town wall already in the 10th century. The old conception, that Radolfzell represents one of the first examples of a medieval town, founded on a free meadow, provided with a special legislation, has to be revised then.^{xlvi}

In Radolfzell, the „inner temple area“, marked by the wall in the houses south of the church was larger than in Bischofszell. The southern gate, looking at the pier, where the boats arrive from the island of Reichenau, was not situated in the middle axis of the church, but south of the western façade. The wall between the graveyard and the Seegasse, mentioned above, probably ran along the western Seegasse up to the Schmidtgasse; if it did so, the first „Seetor“ would have been placed exactly in the middle of its lakeside front. To the north, a similar wall can be reconstructed along the Höllgasse and Poststraße, with the gate at the Schützengasse, nearly in the middle of its length. The western front of this inner temple area was much shorter, because the ridge, the church was built upon, is getting narrower to the west; to the north, a marshy lowland limits the settlement area.

Already in the 10th century or earlier, the collegiate priests diverted a creek from Böhringen north to the Reichenauer Wiesen (marshes) along the Allweilerstraße and the Markthallenstraße to the Gerberplatz, to drive a mill at the western end of the peninsula (the Untermühle or Spitalmühle and later also the Lohmühle).^{xlvii} A small canal, documented in the excavations in 2017, proves the existence of the „Mühlbach“ even in the 10th and early 11th centuries, though it was mentioned first in 1155.^{xlviii} It ran along the northern boundary of the ridge, maybe crossed by a bridge at the Schützentor. In late medieval times the main gate to the city was the Untertor (lower gate) at the western end of the city, because the street tending towards Stockach via Steisslingen and the Hohentwiel was very important. The noblemen of Friedingen, who played an important role in the history of the collegiate in the 12th and 13th century, built their castle halfway between Radolfzell and the Hohentwiel. 1267 the abbot Albrecht from Ramstein granted the citizens of Radolfzell a great privilege, after he had bought the town from the noblemen from Friedingen.^{xlix} After that, the town wall was built. In earlier medieval times the administrative centre of the Lake Constance region was the royal palace at Bodman, which gave the Lake Constance its german name: „Bodensee“, means „lake of Bodman“.¹ It can be reached via Güttingen or Stahringen, to the north of Radolfzell, where the Schützentor is directed to.

The distance between the Schmidtgasse and the suggested southeastern corner of the inner temple area measures 184 m, or maybe 250 large yards, if the inner temple area was planned to be half as large as the outer one. This corresponds to the above mentioned yard used in Saint Gall as measure for linen (73,54 cm, or two feet plus one handbreadth)^{li}, but it probably was not the original measure, as will be argued below. But this mistake can already be supposed for the 12th century, when the defenses of the city were built: The southwestern corner of the city, the „Steighaus“ is about 368 m away from the city moat to the east, or 500 large yards. The Seegasse below the above mentioned wall of the inner collegiate area is supposed to be an extension of the 12th century, after the market was transferred from outside the „temple“ into the inner collegiate area, north to the minster.^{lii} There are no elder finds in this lower part of the city, where the ground had to be filled up with earth and wood, so it could be built upon. Probably the material was taken away from the top of the hill, around the church, or from the moat to the east of the city. Additionally a pier into the lake was thrown up (the so called „Seedamm“), but the time is unknown, when it was built. An early map of the stronghold of Radolfzell (early 18th century) shows a long peninsula, reaching southwards from the gate at the lakeside (Seetor) down to the recent shore.^{liii} In Constance a remarkable extension of the land into the lake was proved by archaeology from the 10th century onwards: first, many wooden piers were built for the ships of merchants; then, the room between the piers was filled with earth and wood.^{liv} Maybe, in carolingian times only the northern front of the temple area was marked, maybe by a fence or a hedge; from the 11th and 12th centuries onwards the southern part of the temple area was added, still following the old plan. On the other hand the layout of the whole settlement is quite similar to that of Saint Gall: The pier, where the monks of Reichenau arrived with their boats, is an equivalent to the market street in Saint Gall, where the bishop enters the city. The church is placed to the right, and behind a creek is floating. To the left, in Saint Gall the palace of the abbot was placed, in Radolfzell 1421 the town hall was built.^{lv} The „additional“ chapel, in Saint Gall dedicated to Saint Othmar, here is dedicated to Maria, standing to the east of („behind“) the church, near the Austrian castle. Its foundations were excavated; it was much smaller than Saint Othmar's church.^{lvi} The „castle“ in the Höllgasse in Radolfzell was also placed to the right, because here a strong defence building was most needed.^{lvii} In Saint Gall the palace of the abbot was called the „Höll“, maybe because of the banquets given in the hall, estimated as sinful behavior, but it was placed to the left of the arriving people.^{lviii} In Radolfzell, the name is explained with the slope, the street is placed at (in german „Halde“).

After investigating the settlement of Radolfzell for relics of the carolingian „temple“, the church itself has to be examined. It was built in the 15th and 16th century (1436-1520/ 1580), with no traces of elder buildings, though scholars tried to identify them: For example in the northern wall of the nave near the choir a former semi-circular arched window or door, now walled in, can be seen in the dusty-gray plaster, but it may be of late medieval date (figure 11).^{lix} At the central pillar in the nave a late medieval or early modern inscription „1007“ maybe refers to a renovation in this year, but it is difficult to handle with – did the masons read the original text the right way? Was it just a fairy tale of a „new church“, then told but now forgotten? At this point it is interesting to compare the late medieval church of Radolfzell with that of Bischofszell: the arcades and the choir show many common features, there is a tower standing to the left of the choir (seen from the nave; also in Saint Gall a tower stood there). A profound study shows: they are constructed similar to each other, the early medieval maybe as well as the late medieval church.

Two equal-sided triangles define the outline of the nave (in Radolfzell together with the aisles, in Bischofszell only the central nave). The choir fits into a square; the centre of the apse, consisting of five sides of an octagon, was marked by a star of two triangles, similar to Bischofszell, which also defines the eastern extension of the tower and the vestry. The overall length of the church of Radolfzell was roughly 60 m or 200 feet, corresponding to 100 yards of 60 cm, or the length of the nave (36,2 m) was equivalent to 40 yards of 90,5 cm or 3 feet, and the length of the choir (18,9 m) to 20 yards of 94,7 cm. The relation of 2:1 was not perfectly achieved, but approximative. The scheme is much simpler than that of Saint Gall, but exquisite and clear. The inscription with the date „1007“ marks the meeting point of the edges of the two triangles in the nave. If the outer walls were erected on the foundations of a predeceasing church, maybe at this point a cornerstone was laid, like at St. Michel's church in Hildesheim (with the date „1010“ written on it).^{ix} St. Michel's church was part of a great project of bishop Bernward, to build his see as a „temple of Ezechiel“, but much larger than in Radolfzell.^{xi} Around this time also the monastery of Saint George was transferred from the Hohentwiel down to Stein am Rhein, so it is not unlikely, that also in Radolfzell a new church was built. In the course of the renovation the old sarcophagus of Radolt, or a rood-loft broke; only one piece was taken away as reminiscence, but got lost in the pit near the lower gate of the settlement, to be found by 21th century archaeologists. Surprisingly the nave of Bischofszell is exactly as wide as the nave of Radolfzell, but the aisles are a bit smaller. So we can copy the plan of Bischofszell in the same scale onto the plan of Radolfzell. The nave of Bischofszell is roughly half as long as the nave of Radolfzell, so the western wall stands at the position of the pillar with the date „1007“. Therefore it is very likely, that on this point really a cornerstone was found, of a church similar to that of Bischofszell. The choir of Bischofszell is a little bit shorter than the vestry and tower of Radolfzell. In front of the church of Radolfzell existed a larger open place than today (even when we suggest a small porch on this side), fitting better to the temple area of Ezechiel, who described the inner yard of the temple as an open place of 100 x 100 yards.

Contrary to Bischofszell, the measure, derived from the inner width of the nave, does not fit to the temple area outside; but the outer width of the triangles, the nave was constructed with, does: 10,5 m correlate to 20 yards of 52,5 cm. The „inner yard“ of the temple area (estimated at the inner wall of the houses south of the church, up to the Schmidengasse) was 184 m = 350 yards long and to the east maybe 131 m wide (250 yards; the Höllgasse is 136 m away from the southeastern edge of the wall = 260 yards). From the Hospitalgasse nearly to the eastern end of the Seestraße, a distance of 262 m fits to a measure of 500 yards, the Seetor (gate facing the lake) standing right in the middle. 260 m to the north, the Mühlbach meets with the outer temple area, coming from the north and then turning to the west. The Schütztor (gate of archers) is placed half way to the point, where the broken piece of masonry from Ratold's church was found, and the postholes and pits with ceramics of the 10th and 11th centuries started. Maybe south from here in the Poststraße the original western gate of the outer temple area was placed. The inner gate stood, where the Kaufhallenstraße meets the Schmidengasse. To the east and to the west, the settlement later grew ca. one hundred meters wide from the „temple“, quite similar to Bischofszell. If we take into account, that the gates of the temple were 50 yards deep (26 m), the place between the recent church and the western gate (at the Schmidengasse) was 60 m = 114 yards, and the width of the open place in front of the gate 52 m = 100 yards, corresponding to the yard described by Ezechiel (100 x 100 yards wide). Therefore a porch (Galilee) in front of the church can be suggested, reaching to the recent façade.

The different yards, used in Radolfzell and Bischofszell can be explained by the method, the buildings were copied from each other. When there are many side-buildings (for example a tower, apse or a vestry), it is likely, that, if you want to imitate a building, you take the measure inside. In Bischofszell, the inner width of the nave seemed to be the main measure, defining the measures of the yard outside. This measure could easily be taken from Radolfzell, using a knotted string (i.e. without calculating the measure by adding the inner width and the thickness of the walls). The construction of the inner yard in Bischofszell, with the northern gate at the middle axis of the church and not at the axis along the façade, as it should be according to Ezechiel, also supports the elder dating of the „temple“ of Radolfzell, which construction is more congruent with the vision of Ezechiel, though the inscription suggests a later date.

Maybe the orientation of the churches can prove this sequence: In the middle ages, the orientation of the choir to the east was very important, but the compass was not known until the 15th century. From roman surveyors, the architects of the middle ages learned to observe the rising or the set of the sun.

At equinox, the sun rises exactly in the east and sets in the west, so this date can be used for determination of the direction of the church.^{lxii} One has to consider, that the calendar, used in the middle ages (scheduled by Julius Caesar) was not exact, so the apparent date was several days behind the real date (following the calendar of Pope Gregor XIII.): in the 9th century about 5 days. In addition to this, often not the equinox, but easter sunday was used to orientate the churches (or building axes, like streets or moats). Easter is celebrated at different days each year, between the 21th of March and the end of April, so it is possible to control the planning date of a church with the easter calendar. The axis of the church in Radolfzell is oriented to the sunset on 2th of April, corresponding to the carolingian date of 28th of March, being the easter date of the year 829 (figure 10). The southern wall of the inner temple area is oriented to the sunset around the 23th of April or 18th of April, following the roman calendar, being the easter date of the year 830. Maybe the laying of the foundation-stone of the perpendicular church on 16th of April in 1436 refers to this date. The year before, easter was celebrated on 17th of April. In both cases, one has to consider the mountains at the horizon, right and left to the Hohentwiel. They hide the horizon, so the sunset happens some minutes earlier than in a flat landscape. On the left, i.e. to the south, above Gottmadingen, later the castle Heilsparg was built (here the sun sets in the axis of the church of Radolfzell; the correlating date in a flat landscape would be the 24th of March or the 29th of March, according to the modern calendar, being the easter date in 832), and on the other mountain, to the right, the castle of Staufen. The castle of Staufen maybe was built in the early 13th century by the dukes of Zähringen, who gave it to the noblemen of Staufen, their vassals from the region of Breisgau.^{lxiii} Nearby the castle of Hohenkrähen was built on a volcano rock, above a village belonging to the monastery of Reichenau. Though scientists thought, the castle was built around the year 1200, a vaulted room besides the gateway exists, which can be dated in the 11th century by the masonry of its walls.^{lxiv} So there's a closer connection between the suggested new foundation of the collegiate church in Radolfzell around the year 1000 and the building of this castle, than thought before. There exist more examples, where castles are built at special axes, seen from market streets towards a point at the horizon the sun rises or sets, sometimes called „Strahlenburg“ (castle of rays) or in similar ways.^{lxv} One could raise the objection, that the southern wall of the temple area follows the natural slope of the shore, but the identified date, easter sunday of the year 830, coincides with the historical tradition: At the 9th of April 830, bishop Ratold came to the island of Reichenau to ask abbot Erlebold for the permission to live in the monastery of Niederzell, at the western end of the island. But Erlebold rejected and sent Ratold instead to a settlement of fishermen on the peninsula Mettnau, at the northwestern shore of the Lake of Constance.^{lxvi} A major farmstead of the abbacy, the Kellhof, existed there since the 8th century. Here the bishop of Verona founded the „Ratoldis cella“, later called Radolfzell. Ratold brought the relics of Theopont and Senesius with him, which he had brought from Treviso. Around Verona, several churches remind the holy places in Palestine, transforming the city into a copy of the Holy City.^{lxvii} So the idea of building a sacred settlement with the bible as a guide was not unknown to him. Erlebold had sent him to Venice to get the relics of the apostle Marc for the minster of Mittelzell, and maybe he also started building the church in Radolfzell the year before, so the holy bones could be brought to their new home right when Ratold arrived at the Mettnau. The following years, Ratold helped the priest Ansgar to foundate the archbishopric of Hamburg. A revolt of the sons of emperor Ludwig the Pious, especially Lothar, the king of Italy, prevented Ratold to go back to his see, because he supported the emperor.^{lxviii} So Ratold probably stayed at Radolfzell, engaged in the building of his monastery; apart from this, he visited Aachen in 836 and Nijmegen in 838. He never returned to Verona until his death, maybe between 844 and 846; then a new bishop was consecrated.^{lxix} The direction of the Seegasse towards the sunset at the Heilsparg also fits to the date 1055, which was suggested by Christoph Stadler as correct year of the granting of the market privilege (easter date: 16th of April correlating to the roman calendar or 22th of April according to the calendar of pope Gregor XIII.).

In Bischofszell, the northern boundary of the graveyard is oriented to the rising point of the sun at 31th of March, or 26th of March, following the roman calendar (figure 11). The church is oriented to the 11th of April or 6th of April. During the reign of Salomo III. (890-919/20) no easter date fits to these axes, but in the time of Salomo I. (838/39-871): 859 and 870 easter was celebrated on the 26th of March, and 861 at the 6th of April. So probably the „temple“ of Bischofszell was founded in the years 859-861, two decades after the foundation of Radolfzell.^{lxx} Maybe the chapel of Saint Michel's on the graveyard had a predecessor of the 9th century, because it is oriented to the sunrise at 19th of April or 14th of April, the easter date in the year 860. Salomo I. was an important advisor of Ludwig the German; together with abbot Grimald from Saint Gall he travelled to Worms in 859 and met bishop Altfred of Hildesheim in Reims in 862, who since 851 built his cathedral (until 872), using the same methods of planning, as could be proved for Bischofszell and Radolfzell.^{lxxi}

Salomo I. even could have met Ratold in his monastery, or the former bishop of Verona visited him in his see. In 864 Salomo I. helped to bring the relics of Saint Othmar, a associate of Saint Gall, to the monastery of Saint Gall, and to build a new church there. In the 11th and 12th centuries it was said, that Salomo III. had brought the relics of Pelagius to Constance, who ascended to the main patron of the see, but contemporary sources indicate, that he was adored already in the early 9th century.

The scheme of the temple with the two courts became important for the building of large monasteries all the middle ages long, the inner yard corresponding to the cloister and the outer one to the economic area outside, with barns, stables, granaries, mills, smithies and other buildings. In a book with legends of saints, written in the monastery of Hirsau in the 12th century, the story of Maria the penitent starts from the description of the eremitage of her uncle, Abraham the Hermit from Chiduna.^{lxxii} She lived in the outer part of the hermitage, because Abraham wanted to stay alone in the central area. Visitors came and persuaded her to go with them. At the end, she arrived in a house of ill fame. Her uncle searched for her a long time, and after he had found her, he took her back, and now he allowed her to live with him in the central part of the hermitage, because the outer area was too dangerous: it was a zone of transition from the holy world inside and the dangerous, sinful life outside. When the inhabitants (for example Maria the penitent, but also the lay brothers of the high middle ages) came in contact with people from outside, they could be misled. The church of Hirsau followed the plan of the temple of Salomo, consisting of a square holy area to the east (the choir and the transept) and a rectangular nave to the west, where the lay brothers attended the service (figure 12).^{lxxiii} The whole church was 67,5 m long (without the chapels east to the choir). If this measure was equated to 60 „yards“ of 1,125 m (before building the Galilee), the two gates of the outer yard of the monastery were placed 100 yards away from the church – like the gates of the inner yard of the temple of Ezechiel are described to be. The two paths to the south and to the west correlate with the two main directions in the antique town planning: The *Cardo* to the south (meaning the „heart line“ of the body, seen from the shoulder) and the *Decumanus* to the west (the latin word means „right hand“). Hirsau also was planned like a model of the city of Saint Gall, reduced to the half scale (but with the direction of the heavens turned upside down, figure 14): The visitor, coming from the south, having passed the *Porta Praetoria* (= *Irer gate*), walks up the *Cardo* like the market street in Saint Gall, arriving at the porch with the church to the right. The western gate correlates to the *Spiser Gate* in Saint Gall, representing the *Porta Dexterior* of a roman castle. In some cities (as in Trier and Pforzheim), in the 12th century, maybe already in the 10th century a scheme of a human body seemed to be put upon the street plan, the market corresponding to the belly, and the streets to the legs and arms.^{lxxiv} Maybe Saint Gall was one of the first examples, because the relics of Saint Magnus (in latin meaning „great“) were fetched from Füssen at the river Lech (which could be translated from colloquial german as „the feet“) - this could be interpreted as a hint at this symbolic meaning.^{lxxv} The idea was transferred to the world maps in the 12th and 13th centuries, for example the map from the monastery of Ebstorf. The street plan of the city of Saint Gall can also be interpreted as simple world map of the „T-O-scheme“, with the streets corresponding to the seas and rivers: the Mediterranean corresponding to the market, the Black Sea and the Nile corresponding to the arms.^{lxxvi} The church is placed in palestine, indicating the locality of Jerusalem. The church in Hirsau was moved a little to the front of the whole area, because there was no settlement of citizens, but only the monastery in the walled area. The same position of the gates can be observed in the city of Bad Gandersheim (Saint Moritz' gate, Saint George's gate, figure 14), built into the immunity area of a imperial collegiate church, standing at the same place like the church in Hirsau, but the scale is roughly one third larger. The monastery was founded in 843/44 until 852, not far away from Hildesheim. The foundation of another monastery dedicated to Mary in front of the immunity boundary maybe is connected with the imagination of Jerusalem and the grave of Mary in the valley of Josaphat. This stresses the association with the vision of Ezechiel and the heavenly Jerusalem. The bell tower to the west of the church in Hirsau, which probably remembers one of the columns of Jachin and Boas in front of the temple (from his counterpart only the foundations survived), consists of two temples heaped onto each other: the lower one standing for the temporal temple, being built by the lay brothers with stone on the earth, and the upper one for the celestial temple, built by the praise of the lord (i.e. the chants of the monks, being sent into the world by the sound of the bells, figure 13).^{lxxvii}

Figures

Figure 1: Church of Saint Gall. Excavation plan with scheme of planning, according to H. R. Sennhauser (yellow). Grey: baroque church (1755-67), hatched: church of Gozbert (830-837), red: reconstruction of the church in the early 18th century, according to P. G. Hecht (revised with the excavation plan).

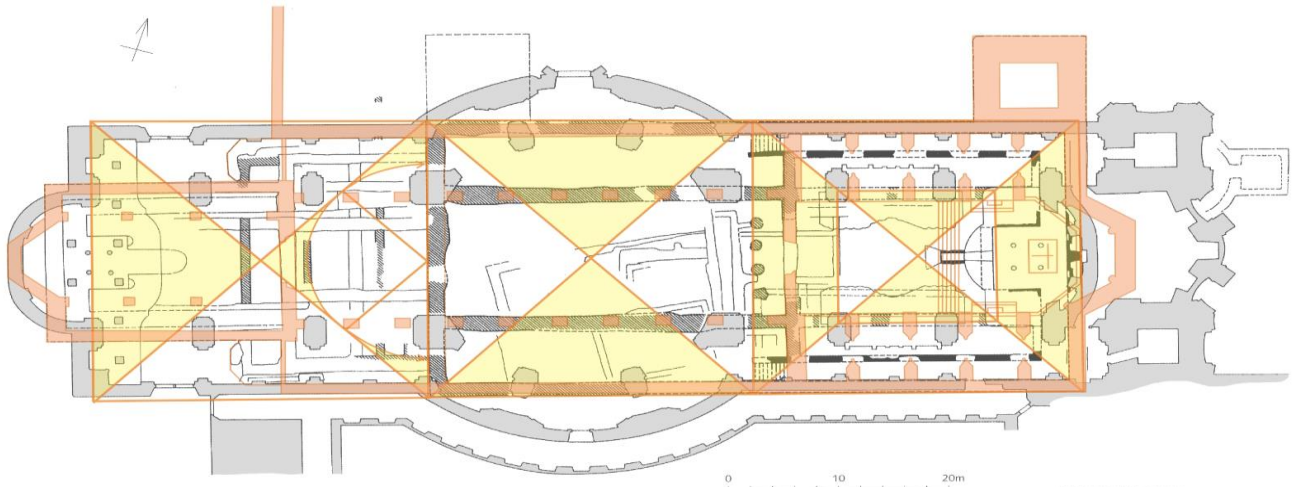


Figure 2: alternative construction scheme of the church of saint Gall (grey), with proposed columns and pillars. A: nave, B: choir, C: crypt, D: grave of saint Gall, E: columns of the rood-loft, F: porch, G: church and crypt of saint Othmar, H: Helmhaus (and chapel of Saint Michel's), J: school tower, K: main tower, L: chapel of the holy grave.

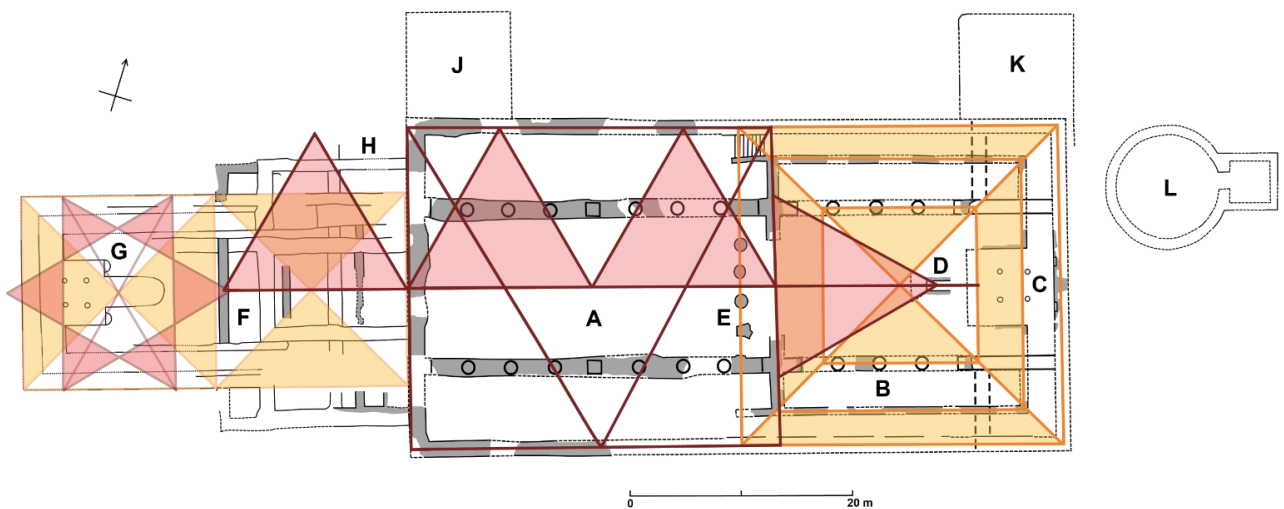


Figure 3: The plan of Saint Gall (after P. G. Hecht, 1724, red, lower scale), combined with the plan of the cathedral of Constance (black lines, upper scale).

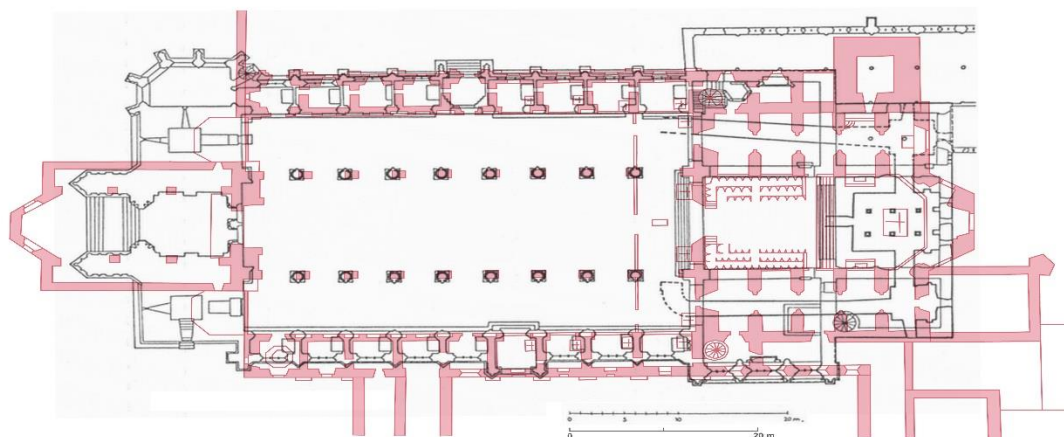


Figure 4: Drawing of the monastery of Saint Gall made by Melchior Frank, 1596. A: Church of Saint Gall, B: Helmhaus, C: Saint Othmar's church, D: School tower, E: Cloister, F: Infirmary, today Abbey Library), G: Refectory, H: Vestry, J: „Höll“, K: „Pfalz“ (palace), L: Gate to the city (Hoftor), M: Karl's Gate (Abbot's gate).

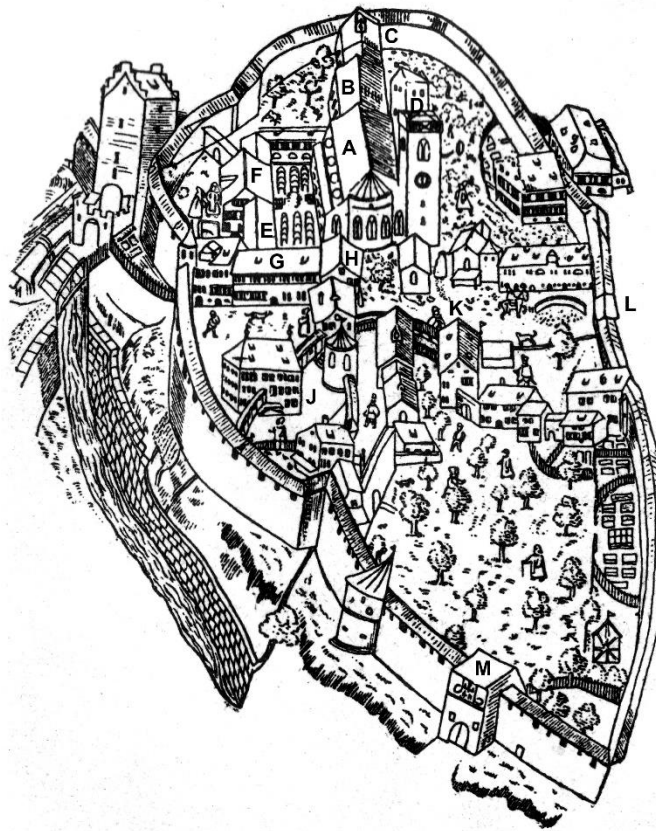


Figure 5: Reconstruction of the church of Saint George's on the island of Reichenau in the late 9th century, with the reconstruction of the apses and the pillars to the west.

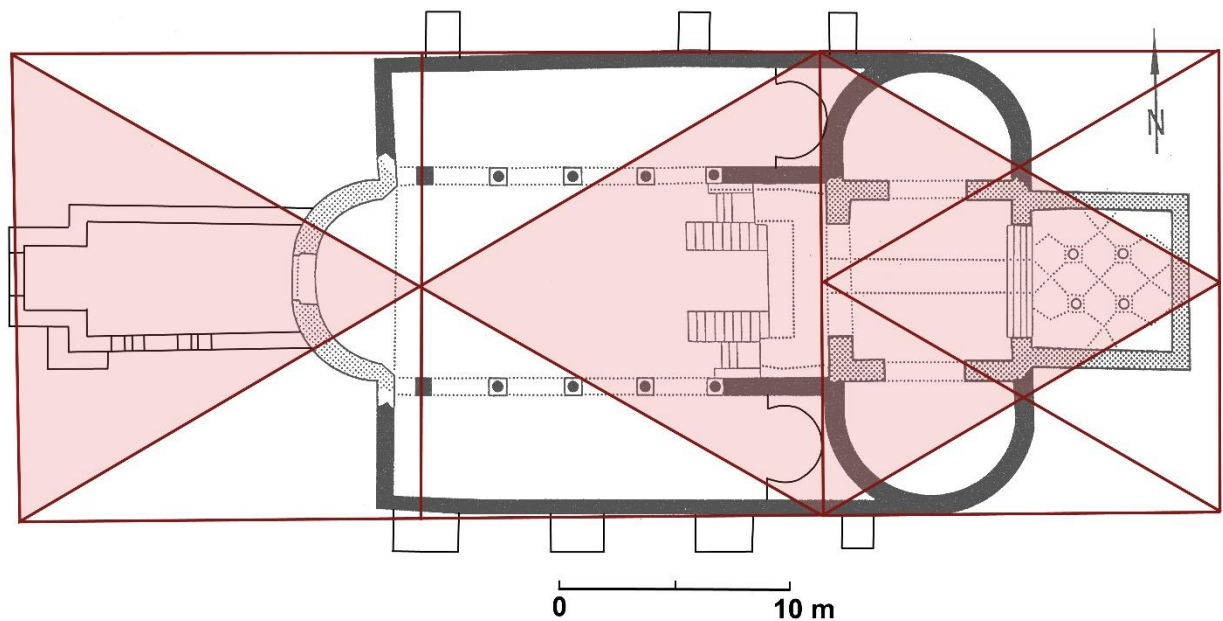


Figure 6: Combined ground plans of the church of Saint Gall (grey) and of the cathedral of Constance (red), with the nave in the same size.

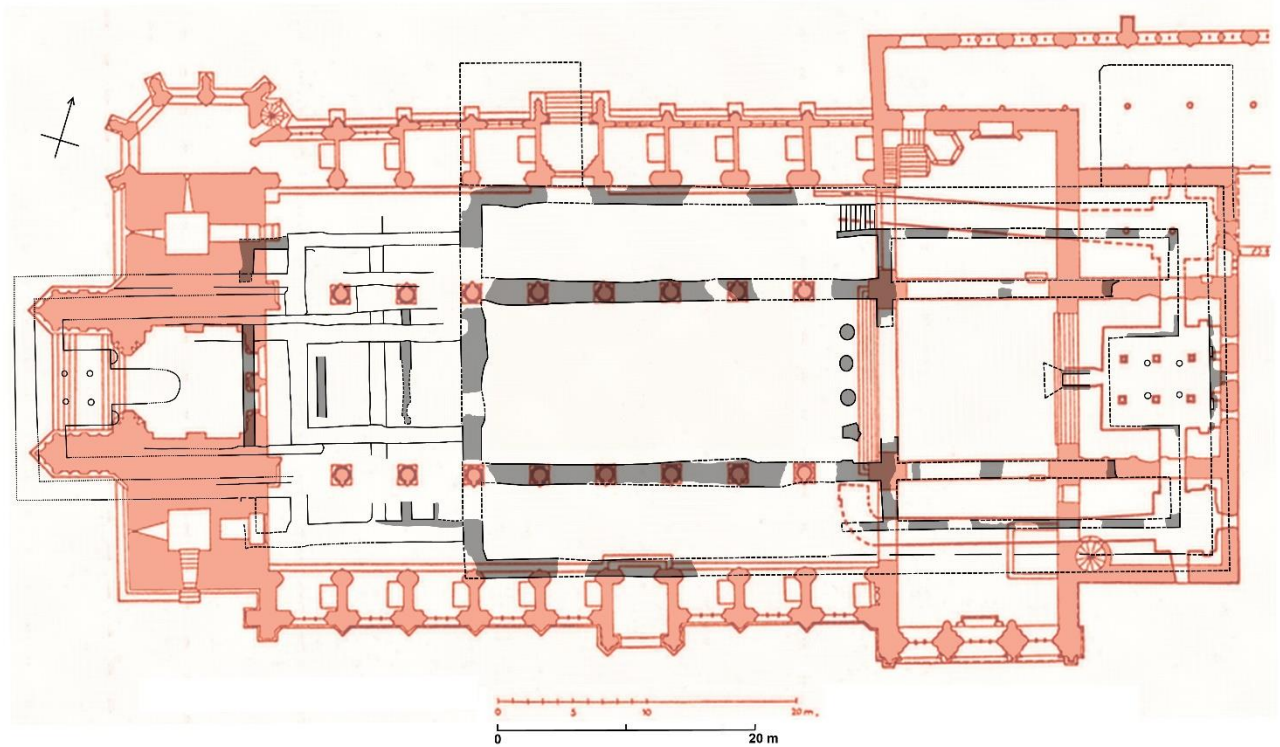


Figure 7: Combined ground plans of the church of Saint Gall (grey) and the church of Petershausen in Constance (red), with the square scheme discovered by H. R. Sennhauser for Saint Gall (yellow).

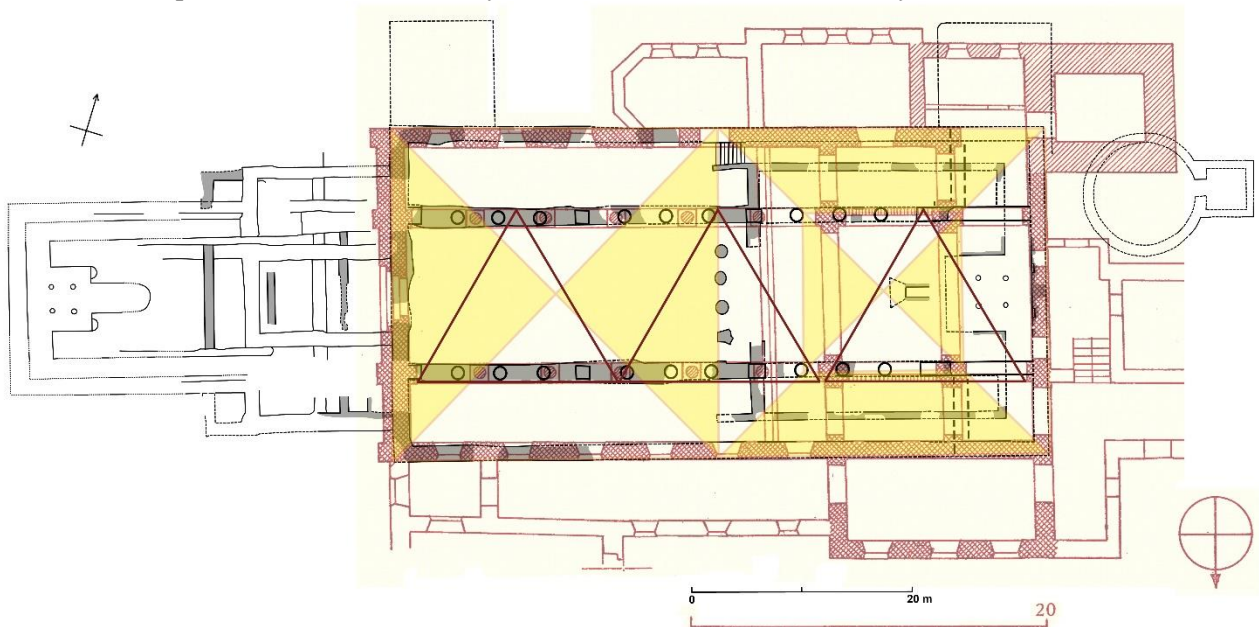


Figure 8: Plan of the excavated foundations of the carolingian collegiate church of Bischofszell (after H. R. Sennhauser), with suggested places of columns and pillars.

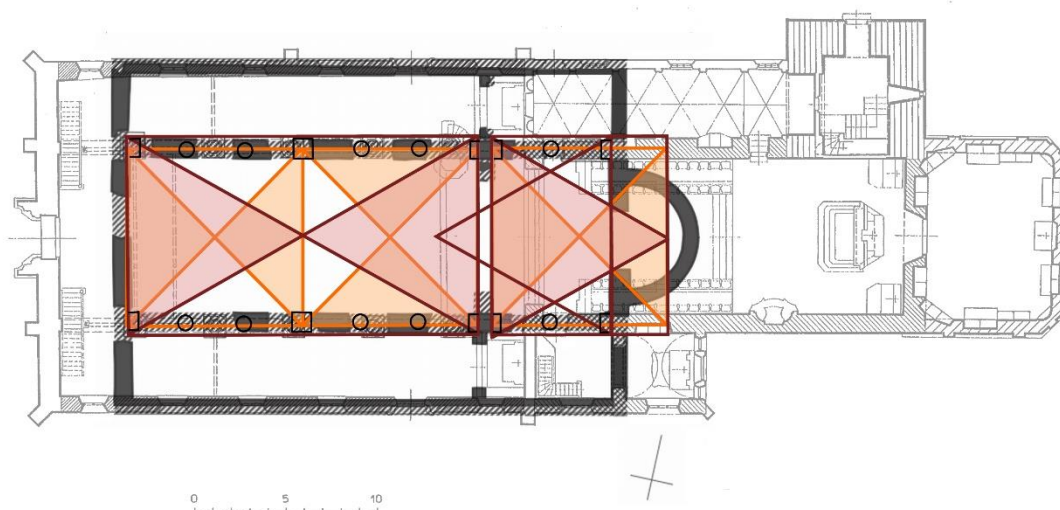


Figure 9: Plan of Bischofszell. A: Church, B: St. Michel's chapel, C: Graveyard, D: Dark tower (castle), E: Town hall, F: Free court, G: House of the Morning mass priest, H: Office house, J: School, K: Former office house, L: Parish Court, M: Court of the clergyman, N: Hospital, O: Gate in the Zeitlockenturm.

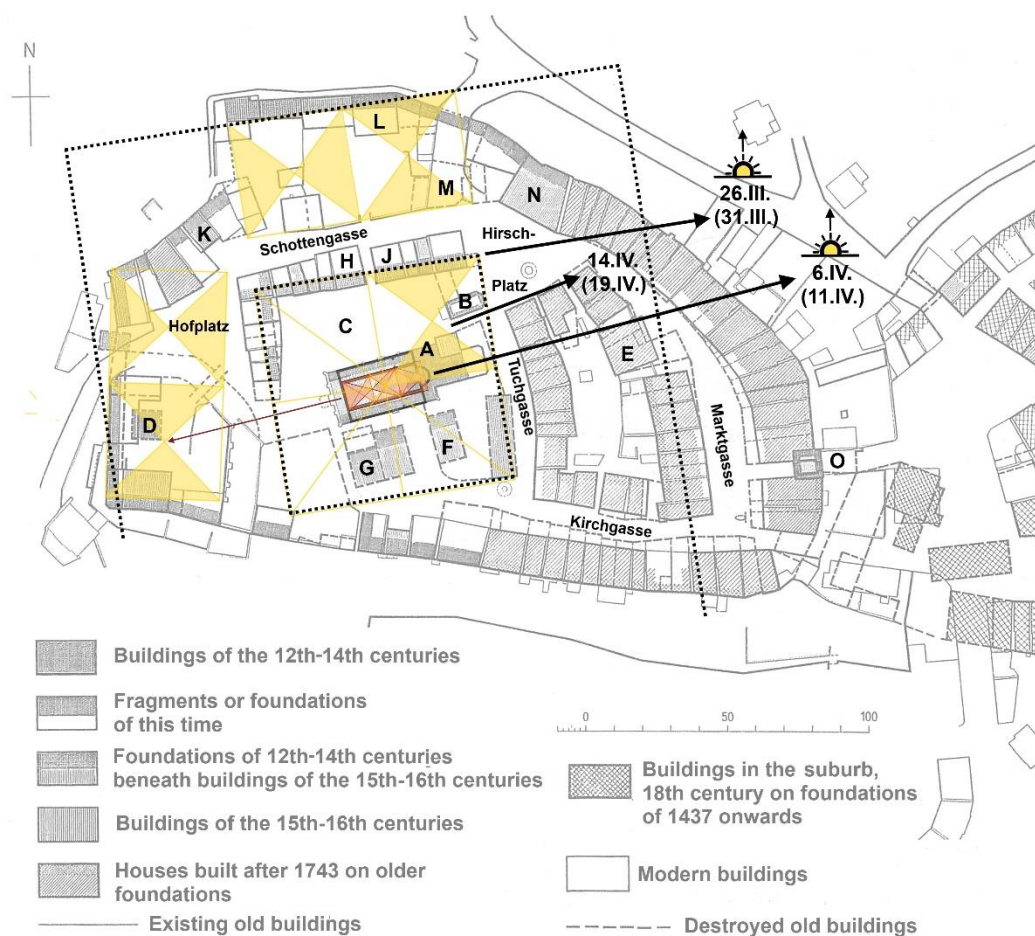


Figure 10: Ground plan of the historical city centre of Radolfzell, with an attempt to arrange the parts of the temple of Ezechiel (left below) as they could be imagined in the municipal area. A: Collegiate church, B: Kellhof (court of the monastery of Reichenau, later castle), C: City moat, D: Upper gate, E: Gate to the lake, F: Lower gate and lower mill, G: Gate of the bowmen, H: Höll tower, J: Tower with depot of gunpowder, K: „Steighaus“, L: Tan-mill, M: Postholes and pits of 9th and 10th centuries, examined in 2017, N: Mill canal, O: Seedamm (pier), P: Gret (staple house, demolished 1869), Q: Town hall, R: Österreichisches Schlösschen (built 1617-1620).

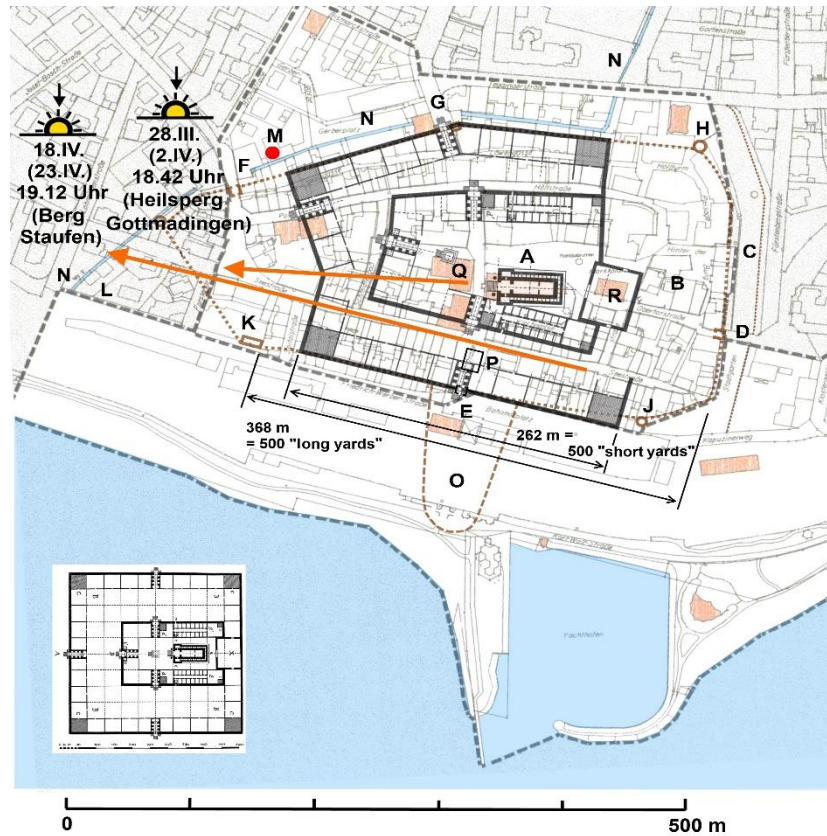


Figure 11: Ground plan of the collegiate church of Radolfzell, combined with the carolingian church of Bischofszell (after H. R. Sennhauser, blue) and the suggested planning scheme. X = pillar with inscription „1007“, D = semi-circular arched door in the wall above the arcades.

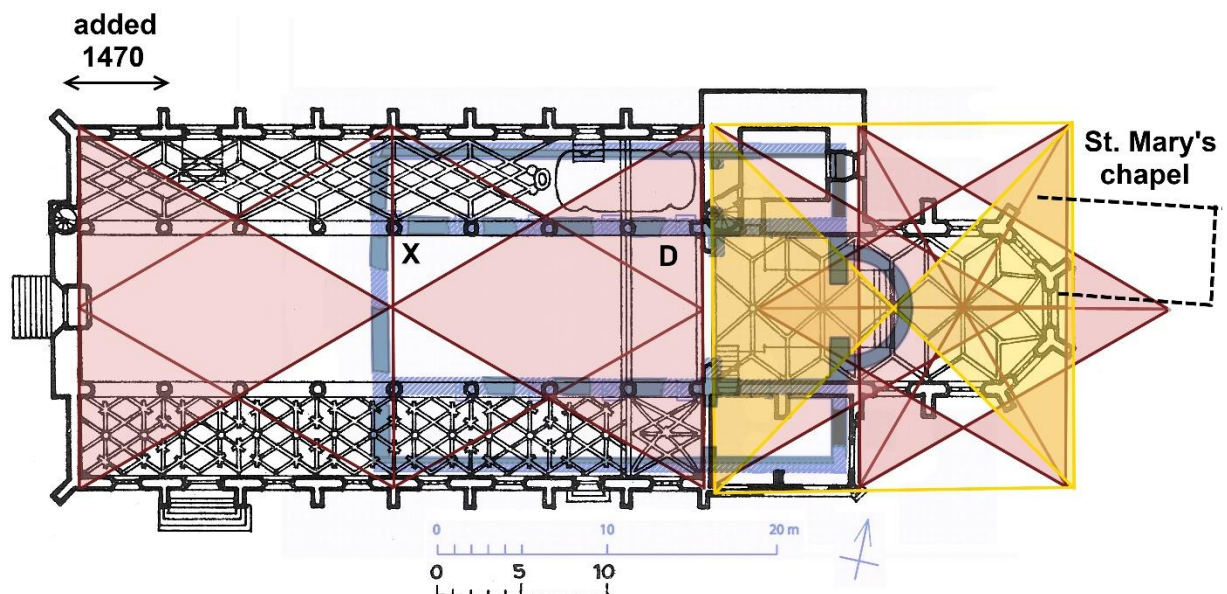


Figure 12: Ground plan of the monastery area of Hirsau (Black Forest).



Figure 13: Elevation of the bell tower of the church of Hirsau, with suggested scheme of planning.

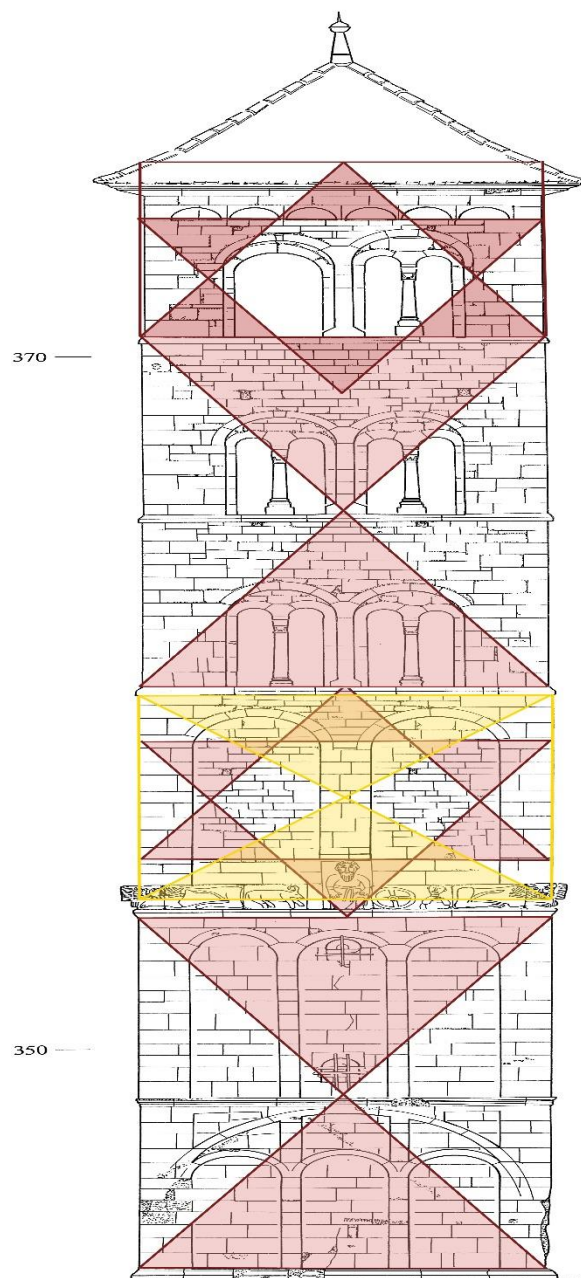
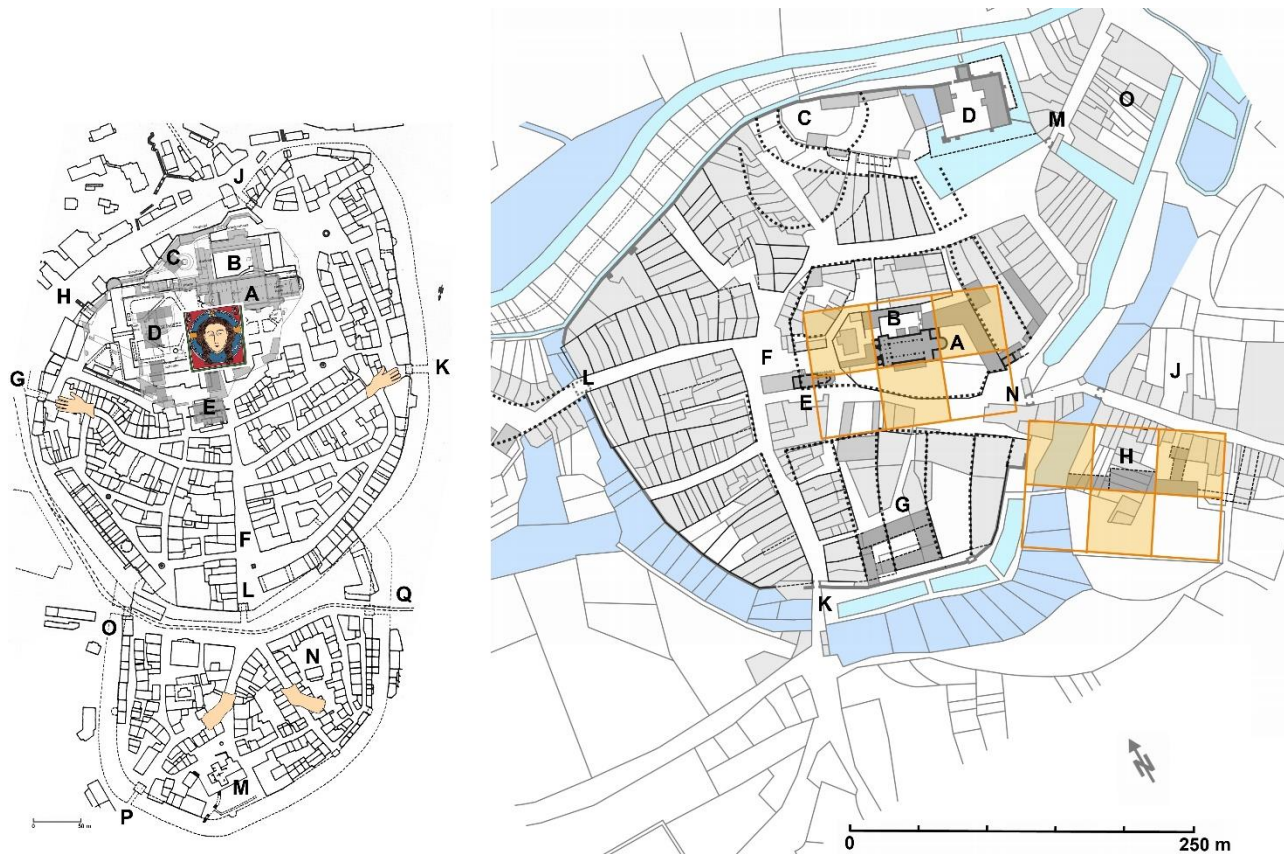


Figure 14: Comparison of the city of Saint Gall (left) and Bad Gandersheim (right). Saint Gall: A = Church, B = Cloister, C = „Höll“, D = „Palace“, E = Parish church of Saint Laurentius, F = Market street, G = Spisertor, H = Abbot's gate, J = Miller's gate, K = Multertor, L = Irertor; M = Saint Mangen church, N = Irer Suburb („Irer“ meaning „black brook“, in latin „aqua nigra“), O = Brühl gate, P = Platz gate, Q = Schibenertor; Bad Gandersheim: A = Church, B = Cloister, C = suggested original place of the castle, D = Place of the castle in early modern times, E = Parish church of Saint Mauritius, F = Market place, G = Franciscan Friary (15th century), H = Benedictine monastery of Saint Mary's, J = New village, K = Moritz' gate, L = George's gate, M = Hagener's



Gate, N = Saint Mary's gate, O = Hagen suburb.

ⁱB. Theune-Großkopf, *Die Alemannia*, in: Römer, Alamannen, Christen. Frühmittelalter am Bodensee, Frauenfeld 2013, pp. 26-31, here p. 28; F. Schnoor, Wetti: *Die Lebensgeschichte des heiligen Gallus*, in: *Der heilige Gallus 612-2012. Leben - Legende - Kult. Katalog zur Jahresausstellung in der Stiftsbibliothek St. Gallen* (27. November 2011 bis 11. November 2012), St. Gallen 2011, pp. 167-193, here p. 176; J. Duft, *Geschichte des Klosters St. Gallen im Überblick vom 7. bis zum 12. Jahrhundert*, in: P. Ochsenbein (ed.), *Das Kloster St. Gallen im Mittelalter. Die kulturelle Blüte vom 8. bis zum 12. Jahrhundert*, Darmstadt 1999, pp. 11-30, here p. 12; O. Feger, *Anfänge und frühe Größe. Geschichte des Bodenseeraumes*, 1, Lindau/ Konstanz 1956, p. 79, 85f.

ⁱⁱH. Maurer, *Die Konstanzer Bischöfe vom Ende des 6. Jahrhunderts bis 1206* (*Germania Sacra. Die Kirche des alten Reiches und ihre Institutionen*. N.F. 42, 1: *Das Bistum Konstanz*), Berlin/ New York 2003, pp. 67-117; O. Feger, *Anfänge und frühe Größe* (see note 1), pp. 157-159. In carolingian poetry the pseudonym of „Salomo“ (and David) was attributed to emperor Charlemagne as well as to king Pepin the Short (762) and Ludwig the Pious, G. Binding, B. Jost, J. Schröder, *Zur Ikonologie der Aachener Pfalzkapelle nach den Schriftquellen*, in: D. R. Bauer, R. Hiestand, B. Kasten, S. Lorenz, *Mönchtum – Kirche – Herrschaft: 750-1000. Symposium anlässlich des 65. Geburtstages von Josef Semmler*, Sigmaringen 1998, p. 193-198.

ⁱⁱⁱW. Jacobsen, Der St. Galler Klosterplan - 300 Jahre Forschung, in: P. Ochsenbein (ed.), Studien zum St. Galler Klosterplan II. "St. Galler Klosterplantagung II" vom 27. bis 29. Oktober 1997, St. Gallen 2002, pp. 13-56; J. Duft, Geschichte des Klosters St. Gallen (see note 1), p. 17; K. Hecht, Der St. Galler Klosterplan, Sigmaringen 1983; W. Horn/ E. Born, New Theses about the Plan of St. Gall, in: H. Maurer (ed.), Die Abtei Reichenau. Neue Beiträge zur Geschichte und Kultur des Inselklosters, Sigmaringen 1974, pp. 407-476/480; www.e-codices.unifr.ch/de/list/one/csg/1092 [access: 13.2.2020]; H. R. Sennhauser, St. Gallen - Klosterplan und Gozbertbau. Zur Rekonstruktion des Gozbertbaues und zur Symbolik des Klosterplanes (Veröffentlichungen des Instituts für Denkmalpflege an der ETH Zürich 23) Zürich 2001; J. Duft/ A. Gössi/ W. Vogler, Sankt Gallen, in: Helvetia Sacra, III: Die Orden mit Benediktinerregel, 1: Frühe Klöster, die Benediktiner und Benediktinerinnen in der Schweiz, part 2, Bern 1986, pp. 1180-1369, here p. 1273.

^{iv} H. R. Sennhauser, St. Gallen (see note 1), pp. 7-11; H. R. Sennhauser, Katalog der frühchristlichen und frühmittelalterlichen kirchliche Bauten in der Diözese Chur und in den nördlich und südlich angrenzenden Landschaften (A1-A125) in: H. R. Sennhauser (ed.), Frühe Kirchen im östlichen Alpengebiet von der Spätantike bis in ottonische Zeit 1, München 2003, pp. 43-221, here pp. 166-171. A similar situation can be observed at San Vincenzo al Volturno in the Abruzzo mountains: Abbot Joshua (792-817) began to build a large basilica, which was dedicated in 808. The written sources tell us, that it was 36 passus long and 16 passus wide, including the apses. This could be proved by the excavations, which brought to light a church 63.5 m long (without the apses: 57 m) and 28.5 m wide, R. Hodges/ S. Leppard/ J. Mitchell, Introduction, in: R. Hodges/ S. Leppard/ J. Mitchell (ed.), San Vincenzo Maggiore and its Workshops. Archaeological Monographs of the British School at Rome 17, London 2011, pp. 1-21, here pp. 1 and 8. The nave could also be described as being 200 feet long and 100 feet wide. The cathedral of Freising, maybe built by bishop Anno (855-875), had the same ground plan, measuring 59.4 x 27.5 m, W. Haas, Der romanische Dom und seine Vorgänger, in: Freising. 1250 Jahre geistliche Stadt. Ausstellung im Diözesanmuseum und in den historischen Räumen des Dombergs in Freising, 10. Juni bis 19. November 1989, Freising 1989, pp. 16-29, here pp. 18 and 21. The church of St. Aurelius in Hirsau was 49 feet wide and 104 feet long, S. Wintermantel, St. Aurelius – St. Peter und Paul. Geometrie und Symbolik der beiden romanischen Klosterkirchen in Hirsau (Archiv der Stadt Calw, Kleine Reihe, 36) Calw 2019, fig. 2.5.

^vW. Jacobsen, Der St. Galler Klosterplan (see note 3), p. 21, 26; K. Hecht, Der St. Galler Klosterplan (see note 3); W. Horn/ E. Born, New Theses (see note 3), pp. 421f.; C. Dora, Der St. Galler Klosterplan und das Gozbertmünster, in: Karolingische Klosterstadt Messkirch. Chronik (2017), pp. 26-34, here p. 34.

^{vi}U. Heckner, Der Tempel Salomos in Aachen. Neues zur Baugeschichte der Marienkirche, in: F. Pohle (ed.), Karl der Große - Charlemagne: Orte der Macht. Essays, Dresden 2014, pp. 354-363, here p. 357; H. R. Sennhauser, Stadtumgrenzung und Grenzen in der Stadt, in: Stadt- und Landmauern, 3: Abgrenzungen - Ausgrenzungen in der Stadt und um die Stadt, Zürich 1999, pp. 147-167, here pp. 153f.; P. von Naredi-Rainer, Salomons Tempel und das Abendland. Monumentale Folgen historischer Irrtümer, Köln 1994, pp. 41, 116, 124.

^{vii}F. Verdenhalven, Münzen und Gewichte aus dem deutschen Sprachgebiet, Neustadt a. d. Aisch 1968

^{viii}R. Moosbrugger-Leu, Die Schnurvermessung im mittelalterlichen Bauwesen, in: Zeitschrift des Schweizerischen Burgenvereins 5, No. 1 (2000) pp. 1-30; T. Küntzel, Das Baulaboratorium der Bischöfe. Überlegungen zur Kirchenplanung im früh- und hochmittelalterlichen Hildesheim, in: Concilium Medii Aevi 18 (2015) pp. 1-60, here p. 14.

^{ix}A. Hardegger, Die alte Stiftskirche und die ehemaligen Klostergebäude in St. Gallen. Ein Rekonstruktionsversuch, Zürich 1917, p. 4; W. Vogler/ H. M. Gubler, Der St. Galler Stiftsbezirk in den Plänen von P. Gabriel Hecht, 1720-1726, Rorschach 1986; W. Vogler, Pater Gabriel Hecht, St. Galler Mönch und Künstlerdilettant, in: W. Vogler/ H. M. Gubler, Der St. Galler Stiftsbezirk in den Plänen von P. Gabriel Hecht, 1720-1726, Kommentar, Rorschach 1986, p. 9-43, here p. 14.

^xA. Hardegger, Die alte Stiftskirche (see note 9), pp. 29-32.

^{xi}A. Hardegger, Die alte Stiftskirche (see note 9), p. 50.

^{xii}W. Vogler, Stadt- und Klostermauern in St. Gallen, in: Stadt- und Landmauern, 3: Abgrenzungen - Ausgrenzungen in der Stadt und um die Stadt, Zürich 1999, pp. 107-115, here p. 111 fig. 7; A. Hardegger, Die alte Stiftskirche (see note 9), plate after p. 76; A. Appuhn-Radtke/ S. Schwarzmann, 1000 Jahre Petershausen. Beiträge zu Kunst und Geschichte der Benediktinerabtei Petershausen in Konstanz, Konstanz 1983, p. 81; M. Spicker-Beck/ T. Keller, Klosterinsel Reichenau. Kultur und Erbe, Stuttgart 2001, p. 98; T. John, Die Klosterinsel Reichenau im Bodensee - "Wiege der abendländischen Kultur" - UNESCO Weltkulturerbe, Beuron 2013, pp. 42-43: painting of Reichenau-Mittelzell in the year 1738, today replaced by semi-circular arched windows, H. Koepf, Romanik und Städtebau (Schwäbische Kunstgeschichte, 1) Konstanz/ Stuttgart 1962, fig. 63; A. Knoepfli, Von der Karolingerzeit bis zur Mitte des 14. Jahrhunderts (Kunstgeschichte des Bodenseeraumes 1) Konstanz/ Lindau 1961, fig. 145-146; F. Hofmann, Frühmittelalter und Romanik am westlichen Bodensee (Bodensee-Bibliothek, 179) Singen/ Hilzingen 2017, p. 89; M. Köhler, Kath. Pfarr- und Wallfahrtskirche St.

Genesius in Schienen, Lindenberg 2005, p. 11; E. Hauswald, Von den Anfängen bis zum Übergang an das Hochstift Konstanz, in: S. J. Egenhofer/ W. Kramer/ R. Welschinger (ed.), Allensbach am Bodensee. Die Geschichte der Gemeinde von den Anfängen bis heute (Hegau-Bibliothek 137) Allensbach 2010, pp. 41-64, here p. 60.

^{xiii}H. R. Sennhauser, Katalog der frühchristlichen und frühmittelalterlichen kirchlichen Bauten (see note 4), p. 166 assigned the crypt to abbot Immo (976-984). In 988-990 abbot Witigowo built the western choir of the minster of Mittelzell on the Reichenau, with a chapel dedicated to Saint Othmar and Saint Michel, W. Erdmann/ A. Zettler, Zur karolingischen und ottonischen Baugeschichte des Marienmünsters zu Reichenau-Mittelzell, in: H. Maurer (ed.), Die Abtei Reichenau. Neue Beiträge zur Geschichte und Kultur des Inselklosters, Sigmaringen 1974, pp. 481-522, here p. 515.

^{xiv}W. Jacobsen/ L. Schäfer/ H. R. Sennhauser/ M. Exner/ J. Mertens/ H. Stoecker, Vorromanische Kirchenbauten. Katalog der Denkmäler bis zum Ausgang der Ottonen. Nachtragsband, München 1991, pp. 229-231; F. Oswald/ L. Schäfer/ H. R. Sennhauser, Vorromanische Kirchenbauten. Katalog der Denkmäler bis zum Ausgang der Ottonen, Ansbach 1966-71, p. 159; A. Knoepfli, Von der Karolingerzeit bis zur Mitte des 14. Jahrhunderts (see note 12), p. 224; G. Kolb, Die Baugeschichte des Münsters, in: Glanz der Kathedrale. 900 Jahre Konstanzer Münster, Konstanz 1989, pp. 45-74, here p. 49; H. M. Gubler, Der St. Galler Klosterbezirk und die Pläne P. Gabriel Hechts, 1720-1726, in: Vogler/Gubler, Der St. Galler Stiftsbezirk (see note 9) p. 45-90, here p. 73.

^{xv}G. Faccani, Verbreitung und Etablierung des Christentums im Bodenseeraum, in: Römer, Alamannen, Christen. Frühmittelalter am Bodensee. Ausstellungskatalog, Frauenfeld 2013, pp. 82-91, here fig. 75a.

^{xvi}Following recent research, this type of arcade can just be dated to the 11th century (phase VIII, bishop Hezilo), K. B. Kruse, Die Baugeschichte des Hildesheimer Domes, Regensburg 2017, p. 226; K. B. Kruse, Der Hildesheimer Dom: von der Kaiserkapelle und den Karolingischen Kathedralkirchen bis zur Zerstörung 1945. Grabungen und Bauuntersuchungen auf dem Domhügel 1988 bis 1999. Mit einem Beitrag von Helmut Brandorff (Materialhefte zur Ur- und Frühgeschichte Niedersachsens, Reihe A, 27) Hannover 2000, p. 103; G. Binding, Die Michaeliskirche in Hildesheim und Bischof Bernward als *sapiens architectus*, Darmstadt 2013, p. 82; M. Untermann, St. Michael und die Sakralarchitektur um 1000. Forschungsstand und Perspektiven, in: G. Lutz/ A. Weyer (ed.), 1000 Jahre St. Michael in Hildesheim. Kirche - Kloster - Stifter. Internationale Tagung des Hornemann-Instituts der HAWK Hochschule für angewandte Wissenschaft und Kunst Hildesheim/ Holzminden/ Göttingen unter Schirmherrschaft der Deutschen UNESCO-Kommission im Rahmen des landeskirchlichen Festprogramms "Gottes Engel weichen nie. St. Michael 2010" vom 16.-18. September 2010 in St. Michael in Hildesheim, Petersberg 2012, pp. 41-65, here p. 44; M. Brandt, St. Michael - Der Gründungsbau und seine Bilder, in: G. Lutz/ A. Weyer (ed.), 1000 Jahre St. Michael in Hildesheim, Petersberg 2012, pp. 88-106, here p. 100; H. Beseler, Gestalt und Geschichte, in: H. Beseler/ H. Roggenkamp (ed.), Die Michaeliskirche in Hildesheim, Berlin 1979 (1954), pp. 13-118, here pp. 49-55; T. Küntzel, Das Baulaboratorium der Bischöfe (see note 8), p. 5, 10, 32; alternating pillars and columns divided the nave of the minster of Reichenau from the aisles, W. Erdmann/ A. Zettler, Zur karolingischen und ottonischen Baugeschichte (see note 13), p. 501; E. Reisser, Die frühe Baugeschichte des Münsters zu Reichenau, Berlin 1960, p. 37.

^{xvii}T. Küntzel, Bursfelde - ein zweites Corvey? Ergebnisse einer Bauanalyse, in: Göttinger Jahrbuch 62, 2014 (2015) pp. 41-52; a close connection between Corvey and the Lake of Constance proves a side altar at the chapel of St. Michael, which was dedicated to Saint Vitus G Maier, Die ehemalige Kapelle St. Michael und Mauritius in Schienen - 1200 Jahre Übertragung der Genesius-Reliquie, in: Hegau. Zeitschrift für Geschichte, Volkskunde und Naturgeschichte des Gebietes zwischen Rhein, Donau und Bodensee 57 (2000) pp. 145-160, here p. 151.

^{xviii}For example Constance, Stein am Rhein, Schaffhausen: F. Hofmann, Frühmittelalter und Romanik (see note 12), p. 30; M. Untermann, Cluny am Hochrhein? Die Anfänge des heutigen Münsters, in: K. Banteli (ed.), Das Kloster Allerheiligen in Schaffhausen. Zum 950. Jahr seiner Gründung am 22. November 1049, Schaffhausen 1999, pp. 109-123; O. Feger, Anfänge und frühe Größe (see note 1), pp. 222, 234-236; A. Knoepfli, Von der Karolingerzeit bis zur Mitte des 14. Jahrhunderts (see note 12), pp. 222f.; A. Knoepfli, Das Kloster St. Georgen zu Stein am Rhein (Schweizerische Kunstführer) Basel 1979, p. 8.

^{xix}P. F. Lufen, Die Ordensreform der Hirsauer und ihre Auswirkungen auf die Klosterarchitektur. Die liturgisch-monastischen, ethischen und ikonographischen Quellen und ihre Einflußnahme auf die Baukunst, Aachen 1982, pp. 55-57; O. Teschauer, Die Ruinenstätte und ihre Erforschung. Zur Geschichte der Grabungen, in: H. Diruf (ed.), Hirsau: St. Peter und Paul 1091-1991, part 1: Zur Archäologie und Kunstgeschichte (Forschungen und Berichte der Archäologie des Mittelalters in Baden-Württemberg 10,1) Stuttgart 1991, pp. 73-137; S. Kummer, Die Gestalt der Peter- und Paulskirche in Hirsau - eine Bestandsaufnahme, in: H. Diruf (ed.), Hirsau: St. Peter und Paul 1091-1991, part 1:

Zur Archäologie und Kunstgeschichte, Stuttgart 1991, pp. 199-208, here p. 201, 207f.; A. Kottmann, Die Hirsauer Bewegung und das Zeugnis ihrer Bauten, in: Zum Bürgelin. Beiträge zur Geschichte von Kloster und Stadt Bürgel sowie deren Umgebung 7, 2001, S.

3-17, here fig. 14.

^{xxv}T. Küntzel, Das Baulaboratorium der Bischöfe (see note 8), p.17; J. Zink, Die Baugeschichte des Trierer Domes von den Anfängen im 4. Jahrhundert bis zur letzten Restaurierung, in: F. J. Ronig (ed.), Der Trierer Dom, Neuss 1980, pp. 17-111, here p. 21-36; W. Weber, Archäologische Zeugnisse, in: H. Heinen/ H. H. Anton/ W. Weber (ed.), Im Umbruch der Kulturen. Spätantike und Frühmittelalter (Geschichte des Bistums Trier 1) Trier 2003, pp. 407-541, here p. 430-432; F. Oswald u.a., Vorromanische Kirchenbauten, 1966-71 (see note 14), pp. 340-342; W. Jacobsen u.a., Vorromanische Kirchenbauten, Nachtragsband, 1991 (see note 14), pp. 419f.; W. Erdmann/ A. Zettler, Zur karolingischen und ottonischen Baugeschichte (see note 13), p. 507.

^{xxvi}F. Hofmann, Frühmittelalter und Romanik (see note 12), p. 54; D. Jakobs, Sankt Georg in Reichenau-Oberzell. Der Bau und seine Ausstattung. Bestand, Veränderungen, Restaurierungsgeschichte, Stuttgart 1999, pp. 280-281; Spicker-Beck, Klosterinsel Reichenau (see note 12), p. 82.

^{xxvii}A. Zettler, Die spätkarolingische Krypta von St. Georg in Reichenau-Oberzell, in: Denkmalpflege in Baden-Württemberg, No. 2 (1989), pp. 97-105, here p. 99 and fig. 2.

^{xxviii}D. Jakobs, Sankt Georg (see note 21), p. 128.

^{xxix}H. R. Sennhauser, Katalog der frühchristlichen und frühmittelalterlichen kirchlichen Bauten (see note 4), p. 40 and fig. 25; W. Jacobsen u.a., Vorromanische Kirchenbauten, Nachtragsband (see note 14), p. 231; A. Zettler, Die spätkarolingische Krypta (see note 22), p. 102, fig. 4; G. Kolb, Baugeschichte (see note 14), pp. 49-50; A. Knoepfli, Von der Karolingerzeit bis zur Mitte des 14. Jahrhunderts (see note 12), pp. 220-222.

^{xxx}F. Hofmann, Frühmittelalter und Romanik (see note 12), pp. 25-26; H. Brommer, Zur Baugeschichte des Münsters, in: H. Brommer/ E. Frey (ed.), Das Konstanzer Münster (Große Kunstführer 163) Regensburg 2005, pp. 26-30, here p. 28; W. Jacobsen u.a., Vorromanische Kirchenbauten, Nachtragsband (see note 14), pp. 231f.; F. Oswald u.a., Vorromanische Kirchenbauten (see note 14), p. 160; W. Erdmann/ A. Zettler, Zur karolingischen und ottonischen Baugeschichte (see note 13), pp. 512-514.

^{xxxi}R. Sigg-Gilstad, Beiträge zur Baugeschichte der ersten und zweiten Klosterkirche von Petershausen, in: A. Appuhn-Radtke/ S. Schwarzmann (ed.), 1000 Jahre Petershausen. Beiträge zu Kunst und Geschichte der Benediktinerabtei Petershausen in Konstanz, Konstanz 1983, pp. 41-69; A. Knöpfli, Von der Karolingerzeit bis zur Mitte des 14. Jahrhunderts (see note 12), pp. 241-248; see also R. Röber, Das Kloster Petershausen im Spiegel der Archäologie, in: Hegau. Zeitschrift für Geschichte, Volkskunde und Naturgeschichte des Gebietes zwischen Rhein, Donau und Bodensee 60 (2003) pp. 97-106. In 2016, the maybe preserved Structures in the underground were examined with radar, but the results are not easy to interpretate: in contradiction to R. Röber and J. Hald, Kirche und römischer Brückenkopf? Neue geophysikalische und archäologische Untersuchungen im Klosterareal Konstanz-Petershausen, in: Archäologische Ausgrabungen in Baden-Württemberg 2018 (2019), pp. 309-313, the dark lines do not show the foundations of the southern and northern walls of the church, but the lines of rubble along the empty trenches. J. Hald friendly told me, that borings produced lumps of mortar, but this can be the same at the floor or with mortar debris, thrown away when the walls were demolished (Email on 18. of April 2020).

^{xxxii}E. Guldán, Eva und Maria. Eine Antithese als Bildmotiv, Graz/ Köln 1966, p. 14; F. Möbius, Himmelssymbolik in den Kirchenbauten der Hirsauer Reform, in: Der Landkreis Calw. Ein Jahrbuch 13 (1995) pp. 153-172, here p. 163; other interpretations: M. Brandt, Bernwards Tür (Schätze aus dem Dom zu Hildesheim, 3) Regensburg 2010, pp. 113-116; B. Gallistl, Die Bronzetüren Bischof Bernwards im Dom zu Hildesheim (with photographs made by Wolfgang Müller) Freiburg 1990, p. 82; T. Küntzel, Das Baulaboratorium der Bischöfe (see note 8), pp. 41, 52f.

^{xxxiii}H. R. Sennhauser, Katalog der frühchristlichen und frühmittelalterlichen kirchlichen Bauten (see note 4), pp. 164-165; J. Duft, Geschichte des Klosters St. Gallen (see note 1), p. 22; K. Graf, Eine Kirche mit mannigfaltigen Schicksalen, in: Die Kirche St. Mang in St. Gallen. Zum Abschluss der Aussenrestaurierung 1979-1982, St. Gallen 1983, pp. 9-16, here p. 9; A. Knoepfli, Von der Karolingerzeit bis zur Mitte des 14. Jahrhunderts (see note 12), pp. 254-255.

^{xxxiv}P. Eckhart, Die Erinnerung an die Bischofszeller Gründungstradition während des Mittelalters und der Frühen Neuzeit, in: H. Steiner (ed.), Wer sanct Pelayen zue gehört... Beiträge zur Geschichte von Stift und Stadt Bischofszell und Umgebung in Mittelalter und Früher Neuzeit, Frauenfeld 2016, pp. 15-30; H. Maurer, Die Konstanzer Bischöfe (see note 2), pp. 74, 105; W. Kundert, St. Pelagius in Bischofszell, in: G. P. Marchal (ed.), Die weltlichen Kollegiatstifte der deutsch-
182 französischsprachigen Schweiz (Helvetia Sacra, Section II, part 2) Bern 1977, pp. 215-245, here p. 216; A. Knoepfli,

Der Bezirk Bischofszell (Die Kunstdenkmäler des Kantons Thurgau, 3) Basel 1962, pp. 48-50, 176; O. Feger, Anfänge und frühe Größe (see note 1), pp. 142-143.

^{xxx}H. R. Sennhauser, Katalog der frühchristlichen und frühmittelalterlichen kirchlichen Bauten (see note 4), p. 42 (he suggested, that the aisles were separated by pillars from the nave), p. 58f.

^{xxxi}T. Küntzel, Stadtplanung XXL - Die "Welfenstädte" Göttingen und Hannoversch Münden neu betrachtet, in: Concilium Medii Aevi 20 (2017) pp. 27-127, here pp. 38-41.

^{xxxii}A. Knoepfli, Der Bezirk Bischofszell (see note 29), pp. 66, 155, 228, 310.

^{xxxiii}I. Ebnetter/ M. Hüebli, Stadtmauer, Tore und Burg von Bischofszell. Ergebnisse aus Archäologie und Bauforschung, in: H. Steiner (ed.), Wer sanct Pelayen zue gehört... Beiträge zur Geschichte von Stift und Stadt Bischofszell und Umgebung in Mittelalter und Früher Neuzeit, Frauenfeld 2016, pp. 289-308, here pp. 291-294; a representation of the tower is delivered on a tapestry exhibited in Basel, M. Ribbert, Der Wandbehang mit der Ansicht von Bischofszell (Basler Kostbarkeiten 34) Basel 2013, p. 18 and fig. 5, 7.

^{xxxiv}A. Knoepfli, Der Bezirk Bischofszell (see note 29), pp. 56f.

^{xxxv}C. Stadler, Radolfzell im Mittelalter, in: H. Bibby/ K. Maier (ed.), Radolfzell am Bodensee: Die Chronik, Konstanz 2017, pp. 43-77, here p. 47; D.-C. Spät, Ein Streifzug durch die sanierte Radolfzeller Altstadt. Radolfzell - damals und heute. Altstadtsanierung 1977-2000, Radolfzell 2000, pp. 40-41.

^{xxxvi}C. Stadler, Radolfzell im Mittelalter (see note 35), pp. 44-47; C. Stadler, Ratold, Bischof von Verona, heilig, in: H. Jäger/ F. Petri/ H. Quirin (ed.), Lexikon des Mittelalters 7, München u.a. 1995, column 461; E. Hlawitschka, Ratold, Bischof von Verona und Begründer von Radolfzell, in: Hegau. Zeitschrift für Geschichte, Volkskunde und Naturgeschichte des Gebietes zwischen Rhein, Donau und Bodensee 42 (1997/1998) pp. 5-44, here pp. 19-20.

^{xxxvii}C. Stadler, Radolfzell im Mittelalter (see note 35), fig. on p. 57; F. Hofmann, Frühmittelalter und Romanik (see note 12), fig. on p. 45; the dating of opus spicatum-type masonry is in dispute, A. H. Schmidt/ K. Frein, "Opus spicatum" - Überlegungen zur Anwendung der "Ährenmauertechnik" im Burgenbau, in: Burgen und Schlösser, No. 3 (2019) pp. 130-148.

^{xxxviii}C. Stadler, Radolfzell im Mittelalter (see note 35), p. 55.

^{xxxix}G. Weber-Jenisch, Archäologie in Radolfzell - mittelalterliche und frühneuzeitliche Fundstellen, in: H. Bibby/ K. Maier (ed.), Radolfzell am Bodensee: Die Chronik, Konstanz 2017, pp. 27-41, here p. 28; C. Stadler, Radolfzell im Mittelalter (see note 35), p. 56.

^{xl}W. Griebel/ B. Jenisch/ T. Küntzel/ P. Sikora, "Glücksklee" in der karolingerzeitlichen Grube - Archäologie vor den Toren von Radolfzell, in: Archäologische Ausgrabungen in Baden-Württemberg 2017 (2018) pp. 246-250; C. Stadler, Radolfzell im Mittelalter (see note 35), p. 64.

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^{xliii}M. Höneisen, Das spätrömische Kastell *Tasgetium* (Stein am Rhein-auf Burg), in: N. Hasler/ J. Heiligmann/ M. Höneisen/ U. Leuzinger/ H. Swozilek (ed.), Im Schutze mächtiger Mauern. Spätrömische Kastelle im Bodenseeraum, Frauenfeld 2005, pp. 86-89; G. Person, Die Herren von Singen-Twiel und der Reichenauer Kelhof in Singen, in: H. Berner (ed.), Singen. Dorf und Herrschaft. Singener Stadtgeschichte 2, Konstanz 1990, pp. 43-74, p. 44; G. Restle, Die mittelalterliche Burg auf dem Hohentwiel, in: Hegau 43/44 (1986/87) pp. 19-43, here pp. 30-31.

^{xliiv}C. Stadler, Radolfzell im Mittelalter (see note 35), pp. 63-66; O. Feger, Auf dem Weg vom Markt zur Stadt. Untersuchungen zu den ältesten Marktrechten des Bodenseeraumes, in: Zeitschrift für die Geschichte des Oberrheins 106, NF 67 (1958) pp. 1-33, here p. 17; K. Beyerle, Das Radolfzeller Marktrecht vom Jahr 1100 und seine Bedeutung für den Ursprung der deutschen Städte, Schriften des Vereins für Geschichte des Bodensees und seiner Umgebung 30, 1901, pp. 3-21, here pp. 20-21.

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- ^{lii}G. Weber-Jenisch, Archäologie in Radolfzell (see note 39), pp. 34f.; C. Stadler, Radolfzell im Mittelalter (see note 35), p. 67.
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- ^{lii}E. Poeschel, Die Stadt St. Gallen (see note 55), pp. 95-96.
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- ^{lii}T. Küntzel, Das Baulaboratorium der Bischöfe (see note 8), p. 46-53.
- ^{lii}T. Küntzel, Die Neustadt Pforzheim - Welfengründung und hirsauische Modellstadt? In: Neue Beiträge zur Pforzheimer Stadtgeschichte 5 (2016) pp. 5-56, here p. 11; T. Küntzel, Stadtplanung XXL (see note 31), pp. 28-30; C. Wiltch, Das ~~184~~zip der Heliometrie im Lageplan mittelalterlicher Kirchen. Nachweis der Ausrichtung von Kirchenachsen nach

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^{lxiii} Eberhard Dobler, Der Staufeu - eine Zähringerburg im Hegau, in: Hegau. Zeitschrift für Geschichte, Volkskunde und Naturgeschichte des Gebietes zwischen Rhein, Donau und Bodensee 12, 1967, S. 27-36, here p. 29.

^{lxiv} E. Dobler, Burg und Herrschaft Hohenkrähen im Hegau, Sigmaringen 1986, p. 45 No. 3; this building was not recognized yet as one of the oldest relicts on the steep cliff, M. Losse, Pfalzen und Burgen der Romanik im Hegau und angrenzenden Gebieten - ein Arbeitsbericht, in: Hegau. Zeitschrift für Geschichte, Volkskunde und Naturgeschichte des Gebietes zwischen Rhein, Donau und Bodensee 74 (2017) pp. 21-36, here p. 25; the name of the castle was first mentioned in 1191, E. Dobler, Burg und Herrschaft Hohenkrähen, p. 29.

^{lxv} T. Küntzel, Ladenburg: "Römisch" auch im Mittelalter? - Thesen zum Ausbau der Stadt im 10./11. Jahrhundert, in: Ladenburger Jahrbuch 9 (2018) pp. 7-48, here pp. 26f.

^{lxvi} E. Hlawitschka, Radolt (see note 36), pp. 19-23.

^{lxvii} H. R. Sennhauser, Stadtumgrenzung (see note 6), p. 157 and fig. 42.

^{lxviii} C. Stadler, Radolfzell im Mittelalter (see note 35), p. 45; E. Hlawitschka, Radolt (see note 36), pp. 23-26; see for the political causes of the revolt C. Hindrichs, Zwischen Reichseinheit und adeligen Machtgeismen. Zu den Gründen des Aufstands von 830, in: Concilium Medii Aevi 13 (2010), pp. 251-287.

^{lxix} C. Stadler, Radolfzell im Mittelalter (see note 35), p. 48; E. Hlawitschka, Radolt (see note 36), pp. 27-29.

^{lxx} See also P. Eckhart, Erinnerung (see note 29), p. 15.

^{lxxi} T. Küntzel, Das Baulaboratorium der Bischöfe (see note 8), pp. 26f.

^{lxxii} A. Boeckler, Das Stuttgarter Passionale, Augsburg 1923, Fig. 32; Württembergische Landesbibliothek Stuttgart, Cod. Bibl. Fol. 57, fol. 234v; the importance of this story already in the 10th century is illustrated by a drama of Hrotsvit of Gandersheim, F. Rädle, Hrotsvit von Gandersheim. Von der poetischen Salvierung einer unheiligen Welt, in: J. Bockmann/ R. Toepfer (ed.), Ambivalenzen des geistlichen Spiels. Revisionen von Texten und Methoden, Göttingen 2018, pp. 259-290, here p. 268; P. von Winterfeldt, Hrotsvitae opera (MGH Scriptorum rerum Germanicarum in usum scholarum separatim editi, 34) Berlin 1902, p. 159, online: http://mgh.de/dmgh/resolving/MGH_SS_rer._Germ._34_S._159.

^{lxxiii} T. Küntzel, Die Neustadt Pforzheim (see note 62), pp. 9-10; Lufen, Die Ordensreform, 1982 (see note 19), pp. 6, 112; this idea was neglected by Stefan Wintermantel, St. Aurelius - St. Peter und Paul (see note 4), fig. 1.21, 1.34, because he wanted to proof the importance of the number „111“ as well as of the description of the celestial Jerusalem in the Apocalypsis; he suggested, that the foot used in Hirsau was 33,1 cm long, but his examples can also be explained in other ways, see pp. 49-61, especially fig. 1.22, 1.25-1.28.

^{lxxiv} T. Küntzel, Die Neustadt Pforzheim (see note 62), p. 24; T. Küntzel, Goldstadt seit tausend Jahren: Die Gründung der Stadt Pforzheim im Mittelalter, in: Journal für Kultur. Magazin für Kultur im Schwarzwald, Kraichgau und am Oberrhein, No. 2 (2019) pp. 18-21; F. Möbius, Himmelssymbolik (see note 26), p. 156-157.

^{lxxv} The church in Füssen had a crypt similar to that of the church of Gozbert in Saint Gall, W. Jacobsen u.a., Vorromanische Kirchenbauten, Nachtragsband (see note 14), pp. 131f.; F. Oswald u.a., Vorromanische Kirchenbauten (see note 14), pp. 83f.

^{lxxvi} T. Küntzel, Hameln: "Heilige Stadt" an der Weser?, in: Hamelner Jahrbuch (2019) pp. 23-52, here p. 44f., 50; B. Englisch, Die St. Galler Kartentradition des frühen Mittelalters. Strukturierte Weltsicht und kartographische Weltordnung in den Schemakarten des frühen Mittelalters (8.-10. Jahrhundert), in: helvetia archaeologica 47, No. 186/188 (2016) pp. 46-123; T. Küntzel, 1166 - Heinrich der Löwe und der Ausbau Braunschweigs zum "sächsischen Jerusalem", in: Concilium Medii Aevi 19 (2016) pp. 1-51, here pp. 7-10; T. Küntzel, Stadtplanung XXL (see note 31), p. 33; E. Rigert/ M. P. Schindler, Gallus, Otmar & Co. - das frühe St. Gallen, in: Römer, Alamannen, Christen. Frühmittelalter am Bodensee. Ausstellungskatalog, Frauenfeld 2013, pp. 92-101; Sennhauser, Stadtumgrenzung (see note 6), p. 149.

^{lxxvii} For the meaning of the figure at the wall, S. Wintermantel, St. Aurelius - St. Peter und Paul (see note 4), pp. 95-136; R. Strobel, Die romanische Bauplastik in Hirsau, in: H. Diruf (ed.), Hirsau: St. Peter und Paul 1091-1991, part 1: Zur Archäologie und Kunstgeschichte (Forschungen und Berichte der Archäologie des Mittelalters in Baden-Württemberg 10,1) Stuttgart 1991, pp. 209-244; S. Kummer, Die Gestalt der Peter- und Paulskirche (see note 19), pp. 206-207.