

Report about the architectural survey of the Parish Church of the settlement of Sanvignes-les-Mines

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Abstract

The medieval church of Sanvignes-les-Mines in Southern Burgundy had been surveyed and researched in 2010 by students of architecture from the Budapest University of Technology and Economics. The survey was part of a 20 year long campaign by the French organization called CEP (Centre International d'Etude des Patrimoines Culturels) for the inventory of Romanesque churches and chapels in the Charolais-Brionnais region. The method used in the survey and research is introduced, and the findings are concluded in the form of a hypothetical relative periodisation of the church.

Keywords

Romanesque ecclesiastic architecture · architectural survey · building archeology · Sanvignes-les-Mines

1 A brief introduction of the architectural surveys in Southern Burgundy

Last summer, students of architecture from the Budapest University of Technology and Economics lead by the authors took part in a survey and research campaign in the Charolais-Brionnais region of South Burgundy for the third time. The French partner organization, which has been running this programme of architectural surveys for the past 20 years, is a civilian initiative called CEP (Centre International d'Etude des Patrimoines Culturels), whose activity might hold lessons even for Hungarian monument preservation.¹

2 The history of Sanvignes-les-Mines and its church

The word “Sanvignes” is probably etymologically derived from the Latin words “sennes vineas”, which can be translated as “old vineyard”. In medieval times, Sanvignes was part of the Duchy of Burgundy. In 1207, Eudes III the Duke of Burgundy bought the settlement for 400 livres from the knight Guillaume Chabuz. The town was one of the six ducal lordships in the region of Charolais (the other five were: Charolais, Mount-Saint-Vincent, Artus, Dondin and Sauvement). A fortified castle once stood on the hilltop near the place where the church is now standing. It was an important stronghold which was mentioned

¹ The CEP was founded in 1989 by a small community of local patriot historians. During the past twenty years, the association has been constantly expanding, and has made a significant contribution to the inventory and preservation of the historic monuments of Southern Burgundy that belong to the World Heritage. The main theme of their research focused on sacral monuments, primarily from the Romanesque period of the Charolais-Brionnais region. The exceptional density of more than a hundred Romanesque or partly Romanesque churches and chapels grants a unique importance to this region. The CEP has been taking care of this heritage since its establishment. It also takes part in international programmes such as “Transromanica”, conducted by the EU gaining the title of “Major Cultural Route” in 2007. This project aimed to connect the one hundred sacral places around Cluny and Paray-le-Monial, and now attracts more than 200,000 registered visitors every year.

The campaign of 2010 involved the parish churches of Chiddes and Sanvignes-les-Mines. The survey was carried out between the 25th July and the 12th August. The participating students were Barbara Csillik, Krisztina Fehér, Márton P. Kaszai, Zsuzsanna Kiss, Kornélia Losonczy and István Makai from Budapest, and Manon Charvolin from Paris.

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Fig. 1. The parish church of Sanvignes-les-Mines

in all the relevant documents in Charolais, but it was badly damaged in 1477, and finally demolished in 1689 [1]. Nothing remains of the castle today, but much of the stone was reused in other buildings of the town.

The church of Sanvignes is first mentioned at the beginning of the 12th century. It was originally consecrated to Sainte Hélène, but fell under the control of the canon of Autun between 1150 and 1170, and was reconsecrated to Saint-Symphorien (the first martyr of Autun in the 3rd century, celebrated on 22nd August). In 1308, it became a “Mense Capitulaire” (the ecclesiastic revenue of the parish was to cover the finances of the chapter in Autun) along with the parish churches of Tagnière, Etang-sur-Arroux and Laisy.

According to Gaudiout Rémy, the oldest part of the church might be the remnant of the old chapel of the late fortress, and is the only part of the medieval town that is still standing [5]. However, over the years it became very run-down and major reconstruction works had to be carried out in 1788, and then again around 1900. Unfortunately, these works were carried out in an incompetent fashion, with the building losing much of its original architectural character, and with the exception of the bell tower, was not awarded national monument status.

3 Survey method

Over the last three campaigns of architectural surveys and research in Southern Burgundy, we developed a new survey method, the elaboration of which can be said to be somewhere between standard architectural surveys on a 1:50 scale and the previously mentioned true-to-form method of building archaeology [3, 7]. (Historic building research carried out over the past few years, shows that a reduced methodology of true-to-form survey resulting from limited time, space or access, can also lead to results that considerably differ to the outputs based on routine historic source research [2, 4].)

First, the section planes were determined with the individ-

ual drawings assigned to the students. As a next step, rough sketches were drawn and some preliminary measurements were taken to determine the approximate dimensions of the building. On the basis of these measurements, the actual on-site freehand drawings or manuals were drawn on a scale $M=1:50$. All the details were drawn free hand so the character of the wall texture was depicted, mostly by the shape and size of every visible stone. We also tried to document some of the different stone materials, colours, surface treatments, the character of the grouting and the type of mortar used. Continuing with the on-site survey, we also tried to analyse and set up the geometrical system of the building phases of the different historic periods. This leads us to a quasi-hypothetic relative chronology.

On the third day of the survey, when the on-site drawings were in a sufficiently advanced state, the detailed measurements were set in motion. An electronic total station was used for the tachymetric surveying, which is equipped with an integrated visible laser beam (TCR) for distance measurements without a reflector. The important points were marked and numbered on each drawing. About 2000 points were measured in one coherent three-dimensional coordinate system, as the reference between them was given by means of pre-determined points. During the measuring process, we orientate the measuring device (total station), aiming it at each reference point. In addition to the digital tachymetry, traditional hand measurements were also taken.

The final drawings were made away from the site in a studio, after the practice based on a combined method of tachymetry, hand measurements and photogrammetry. These drawings with the original on-site drawings and photographs, provided data and a basic documentation for the history and the structural composition of the building.

4 General description of the building

The church consists of a single nave, a short, single-nave transept (subdivided by the crossing into approximately three equally sized parts), and a semi-circular apse. The crossing is connected directly to the apse without any kind of a choir. The vaulting of the apse is a semi dome, but the Triumphal Arch between the crossing and the apse is a double one; there is a pointed arch on the top together with a circular arch underneath. The transept is covered with pointed barrel vaults and the crossing with a regular barrel vault.

The mass of the church is unusual, because the bell tower is very wide since it follows the size of the crossing. The tower has two levels with semi-circular twin arches of coupled windows on all of the four sides of the upper level. The odd character of the mass is increased by the very wide single nave, which matches the width of the crossing, making the latter barely noticeable from the outside. The nave has more strange characteristics. The longitudinal walls are not straight at all; there is a slight “S” like bend in their plan, running more or less parallel with each other. The strangeness of the nave increases as we notice their significant tilting. Normally tilting is not at all unusual in the

case of medieval buildings, as the vaulting can push the top of the walls outwards. However, this case is different, since only the northern wall is tilting outwards, while at the same time the top of the southern wall has moved inwards (so the direction of the movements is the same), furthermore the nave was never vaulted because the span is too big. Still, all the longitudinal walls are reinforced with buttresses. Currently the church has a coffered wooden ceiling with a king post type roof (which does not produce any horizontal forces). The western end of the nave has a wooden gallery.

The western facade of the church shows other oddities: the probably medieval doorway is framed into a 19th century wall-structure. A comparison of survey plans made from the area before and after the 19th century reconstruction shows, that the church was elongated with one bay to the west.

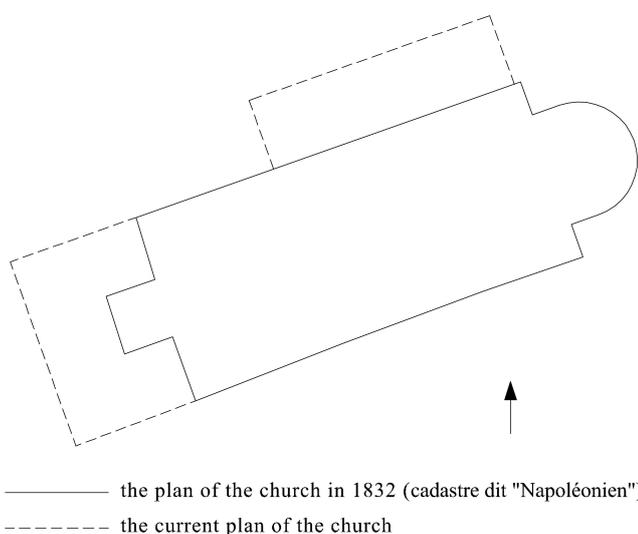


Fig. 2. The comparison of the survey plans from before and after the 19th and 20th century building works

The whole gateway from the original western facade was moved to a new position. Another addition is the sacristy on the northern side that covers the northern wall of the transept and two-fifths of the nave.

Almost all of the outside wall surfaces are unplastered, except for two sides of the sacristy, therefore the wall-texture is easy to observe.

5 General observations

Even without a detailed archaeological survey, there are several aspects of the building that can be investigated to try to establish a hypothetical periodisation of the different constructional parts. The analysis of the constructional grids, the wall thicknesses, the wall tilting, the wall textures, materials and the windows, gates and other details can all provide valuable information.

5.1 Constructional grids

Two major grid-systems can be observed on the building. The first is the grid staked out by the transept and the apse. The overlapping of the centre point of the apse and the longitudinal axis of the transept proves their common coordinate system.

The second grid is determined by the longitudinal walls of the nave. The 19th century addition to the western end of the nave and the current western facade also followed this system. The longitudinal axis of the nave is pointing directly at the centre point of the crossing, but it is rotated 1°41' to the north. At first glance, the curved walls of the nave do not seem to follow any kind of system, but on closer examination it is clear that the base of the northern wall is clearly following this second constructional grid, only the top of the wall is pointing in a direction further to the north due to a later deformation. Even the "S" shaped southern wall is in accordance with this system if we draw a line joining the two ends of this wall (between the transept and the end of the fourth bay of the nave).

This second grid could be the result of an incorrect staking out, because, as we see later, the nave belongs to a later building period than the transept and the apse. The curvature of the southern wall was probably caused by trying to connect the wall of the transept and the shifted western grid.

5.2 Wall thicknesses

According to the wall thicknesses, six different groups can be determined:

- a) The first is the transept and the first four bays of the nave. They have the thickest construction of all: between 106 and 116 cm. The dimensions of the longitudinal walls of the nave are hard to determine, because of their deformations, and the fact, that their internal and external surfaces are not always parallel (probably later corrections trying to mask the deformations). The medieval gate at the western facade also has the same measurements.
- b) The second group is the wall of the apse. Its thickness is 70 to 75 cm behind the false arcade, but 106 cm over the cornice and underneath at the plinth (which corresponds to group one).
- c) The western wall of the church and the last bay of the longitudinal walls have a thickness of 68 cm (40 cm for the gable wall).
- d) The eastern part of the sacristy has almost the same dimensions; its walls measure 50 to 60 cm.
- e) The western part of the sacristy, which is a 20th century addition housing the heating centre for the church, is only 25 cm thick.
- f) The walls of the bell tower measure 70-80 cm.

Fig. 3. The constructional grids of the church

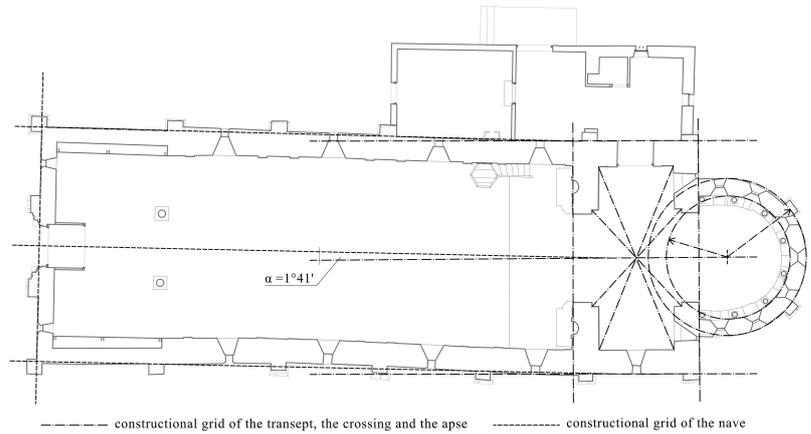
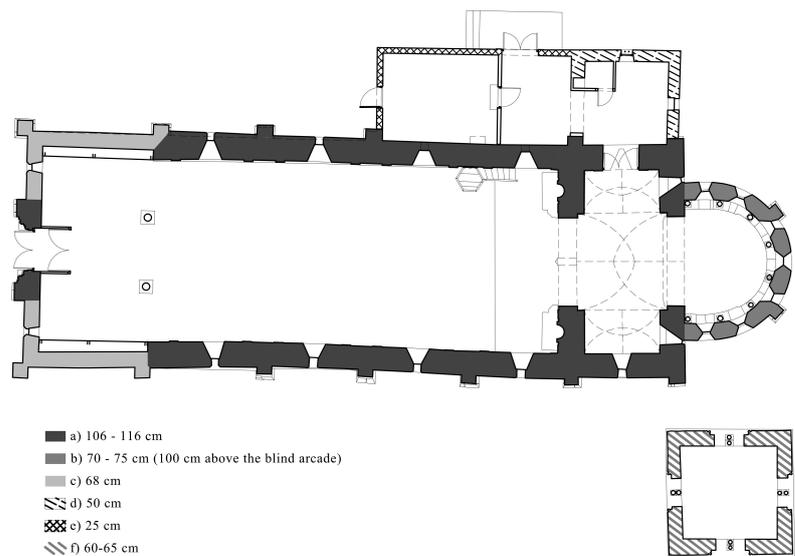


Fig. 4. The different wall thicknesses



5.3 The tilting of the walls

As previously mentioned the two longitudinal walls of the nave show significant deformations. The southern longitudinal wall of the nave has an “S” shaped plan and it is tilting inwards (Fig. 5), while the northern wall is tilting outwards (Fig. 6). Therefore, they lean more or less parallel to the direction of the valley north of the building. Again, it has to be mentioned, that the nave was never vaulted, and even if it were, that would not explain the direction of these deformations. A much likelier explanation would be foundation problems. The hill, where the medieval fortress and church of Sanvignes was built, has a sandstone base that provided the raw material for the walls. The stone formations can even be observed on the surface along the road running past the church. The transept and the apse seem to be resting on this stone base (parts of the foundation are visible because the surrounding terrain was deepened). Perhaps the foundations of the western parts of the nave did not reach this stone base, and as a result the walls started to lean over and the southern wall may even have started to slide towards the valley. With the help of the digital tachymetry, these deformations could be measured very precisely in three dimensions. Figs. 5

and 6 show these measurements with a graphical expression, and the pattern they depict is well worth observing.

On the southern facade, the wall of the transept is still vertical; as we head west the tilting starts to increase, but just before the fourth buttress of the nave the wall suddenly becomes vertical again. This is not surprising, if we consider that the western facade originally stood at this point, perpendicular to the direction of the deformations and it must have stabilised the end of the longitudinal wall helping it to remain vertical. The last bay is a later addition that did not suffer the same foundation problems, so it also remained vertical.

The northern wall shows a different picture. The first two bays of the nave (heading from east to west) are almost entirely hidden by the sacristy. However, the last few rows of stone under the cornice are visible and their measurements compared to the plan show that this part of the northern wall remained vertical. This changes abruptly at the second buttress, the top of which is tilting nearly 25 cm towards the valley. This is only possible if these two parts of the wall are in fact separate constructions. In this case, the vertical part of the wall must be a later structure replacing the original first two bays of the wall,

Fig. 5. The inward tilting of the nave's southern longitudinal wall (relative to the plinth)

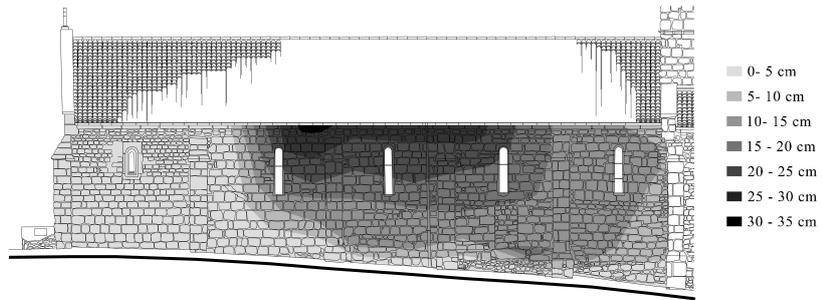


Fig. 6. The outward tilting of the nave's northern longitudinal wall (relative to the plinth)

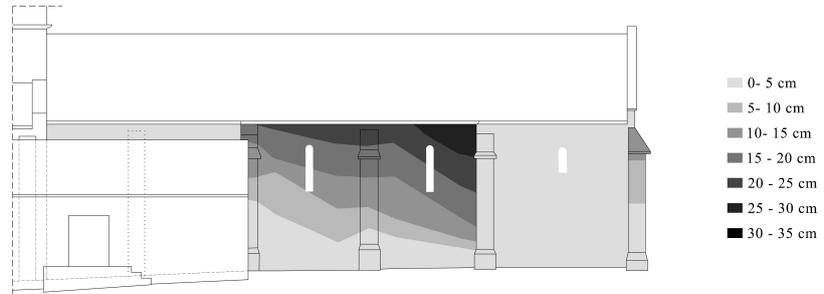
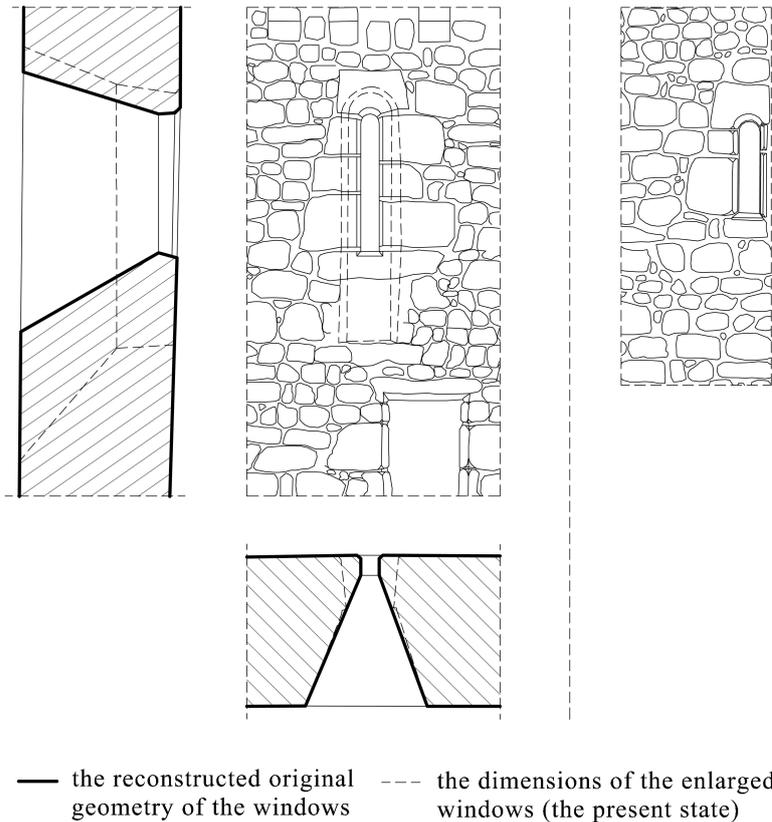


Fig. 7. left: the reconstructed geometry of the southern window of the transept right: the western window of the transept



which had collapsed or had been demolished. The sudden step in the exterior surface is not visible from the inside of the nave; later renovation works must have masked it, which explains the varying thickness of the longitudinal walls.

Unlike the southern wall, the northern wall shows the biggest tilting right at the point before the fourth buttress of the nave, where the western facade once stood. Because the northern wall was moving outwards, the resulting tensile forces could have

split the longitudinal walls away from the original western facade.

The 19th century walls of the last bay are once again vertical. Only the buttress in the north-west corner of the church is tilting outwards. Both of the corner buttresses at the western facade are positioned quite untectonically, they are barely interwoven with the rest of the masonry and north-west buttress is starting to dislocate from the rest of the construction.



Fig. 8. The “crocket” (or ball flower) capitals of the nave

5.4 The analysis of the wall textures

The church was built using a local sandstone of poor quality, most of which is completely exposed on the outside, while most of the inside is plastered. Over the years, the material has deteriorated significantly, probably because of the pollution from the neighbouring coalmines. Nevertheless, we can distinguish several types of masonry when observing the wall textures:

- a) The walls of the transept and the apse appear to be the oldest of all. They have a scattered pattern with rather small and irregular stones. The elements have a lightish cold grey or greenish colour, with darker yellowish and reddish stones mixed in. The stones are masoned in rows that are not horizontal, and sometimes they are even discontinuous. We can also find several levelling rows. A simple cornice crowns the wall with a continuous slab section supported by brackets. Both have the same vertical plate on top of an almost unrecognizable *syma* profile

The lower part of the wall is significantly different; it appears to be a part of the foundation that became exposed when the surrounding soil level sank. It only has reddish stones cut to be quite large, and they are in a more deteriorated state due to the closeness of the ground (so this part could have drawn much more water from the soil and from the rain). The same type of foundation wall can also be observed on the first bay of the nave’s southern wall.

The walls are reinforced with buttresses made of ashlars two or three times larger than the regular stones. Some of the ashlars had to be replaced, mostly the lower parts. The buttresses have an oblong profile and an out projected footing with a simple sloping cover stone. The top of the buttresses start with an overhanging vertical plate topped with a sloping part of around 45°, followed by a steeper slope that gradually disappears into the wall. All the buttresses in other parts of the church follow this design.

The interior surfaces of the transept and the crossing are exposed. Their texture shows the same characteristics as the

exterior walls. Unfortunately, the surface of the stones were treated with a bush hammer and the joints were refilled using cement mortar with a thin recessed line drawn into them. This typical 19th century finish does not help to preserve the authentic medieval atmosphere. The inner surfaces of the apse are plastered plain surfaces, except for the blind arcades, which look like authentic medieval masonry.

- b) The bottom part of the first three bays of the nave’s southern wall seems to be different from the upper parts of the wall. The stones are bigger than in the walls of the transept and the apse, but smaller than in the parts above. The rows are not of equal height, they are wavy and sometimes discontinuous. Some of the stones are shaped almost like ashlars, but their size varies.

- c) The 3rd and 4th bay of the northern wall and the 4th of the first four bays of the nave’s southern wall and the bell tower show a slightly different texture. The masonry is more even, and the stones are bigger. The rows vary in height, but are more or less level. The material used has a darker colour, and some scaffolding holes can be identified. The cornice is the same as on the transept.

On the southern wall, there is also a difference between the upper parts and the lower parts of the buttresses. The upper stones are less weathered, and they have sharper edges. It is interesting to observe the masonry rows around the buttresses. On both the upper and the lower parts, they run continuously in accordance with each other, but there is always a point of disturbance where this order has been upset. Moreover, these coincide with the boundary between the upper and lower masonry type in this wall. This indicates that type b) and c) belong to separate building periods. Furthermore, neither the upper nor the bottom part of the nave’s southern wall is properly interwoven with the wall of the transept; small irregular stones were used to level out the differences between the adjoining parts.

The interior of the nave is plastered. The wall is decorated with fluted pilasters reaching the ceiling, but they are just plastered profiles.

The tower’s masonry shows the same characteristics as the nave’s walls, except for its western side. The stone material and the texture are the same with the scaffolding holes clearly recognisable. A single stone-row cornice divides the tower’s two levels. The lower part does not have any openings, while the upper one has a coupled window on either side of the tower, sitting directly on the intermediate cornice; pairs of dwarf columns divide the two windows. Their material has deteriorated to an extreme state, and they are in urgent need of intervention.

- d) The first two bays of the nave’s northern wall are almost entirely hidden by the sacristy. Only the last few rows of stone under the cornice are exposed; the lower parts inside the sacristy are plastered. The part that is visible shows a masonry

structure composed of smaller irregular stones laid in wavy rows, which resembles the walls of the transept and the nave, but they are clearly not interconnected. The buttress between the first and the second bay was chiselled away to make way for the extension to the sacristy.

- e) The walls of the last bay of the nave and the western facade show a mixed picture. The buttresses, the base of the longitudinal walls up to the windowsill, and the base of the western wall up to the upstairs windows seem to be from the same masonry structure as the rest of the nave: big ashlar laid in correctly levelled rows. However, since this part of the church is clearly a later addition these stones were probably reused from earlier demolished parts of the church, like the former western wall. The upper part of the walls is quite different. The stones are half the size, and their colour is cooler and greenish. The rows' height is constant, and they are correctly levelled.

The western gate and its surrounding wall is clearly of medieval origin and it belonged to a much thicker construction. However, the perfect interweaving with the rest of the western wall indicates that it was relocated stone-by-stone to its present status.

- f) The western side of the bell tower's upper level between the cornerstones appears to be a substitution. The masonry is identical with the 19th century structure of the western facade. Only the twin-arched window looks original, nevertheless the trunk of the dwarf-columns has clearly been replaced, and an upside-down capital was used as a base.
- g) The eastern wall of the sacristy seems to mimic the oldest medieval masonry of the apse and the transept. It is made of irregular stones of varying size and shape laid down in wavy rows. The corner ashlar are not very different from the regular elements and the sharp edges reveal their relatively recent origin.
- h) The northern and western walls of the sacristy are the only plastered surfaces on the exterior of the church.

5.5 The analysis of the windows and other details

Most of the windows do not preserve their original medieval state. The three original windows of the apse are exceptions the centre window and the second ones on either side. They are finely carved with medium sized ashlar and bevelled from both sides, with the narrowest point located at the middle of the wall. Later four additional windows were opened by simply cutting into the masonry and plastering the rough surfaces. The other original windows are the small eastern windows of the transept. They are located very close to the wall of the apse so their bevel is somewhat diagonal, and are framed with ashlar on both sides. Their narrowest point is very close to the exterior surface and so small, that their semi-circle arch is carved out of a single stone.

The windows on the transept's and the nave's longitudinal walls have different, rather gothic proportions. A closer observation reveals, that they have all been altered, except for the northern window of the transept, which was walled-in when the sacristy was built. Fig. 7 shows the reconstruction of the opening's original geometry based on the unaltered northern window. It appears that all of the windows were fashioned after the eastern windows of the transept, and it was probably only during the 19th century, when the church was glazed, that they were elongated and widened to let in more light. That is probably when the four new windows of the apse were also opened.

The windows of the 19th century addition of the nave show a mixed picture. The two bottom windows of the western facade are 19th century windows, but the four illuminating the gallery appear to be older, reused and in a secondary position.

The poor quality of the sandstone used did not favour sculptural decoration.

The only original doorway, which was relocated to its present place during the addition works, is a nice late Romanesque doorway-type: its lintel is semi-circular, and follows the model of "orders of arches and jambs". The corners are always followed by three-quarter columns forming an alternating rhythm. The footing and the capitals are in a very bad condition. The footing could have been a simplified form of an "Attica" type lacking a recess, while the capitals follow the so-called "sprout-like" column type. There are two carved stone faces on the corbels supporting the lintel, which have a matching pair that support the blind pointed arch over the triumphal arch leading into the apse. The blind-arcade in the apse's interior has the same capitals as the doorway, but in a much better condition.

Comparing these sculptural details to other churches in Charolais reveals that their origin cannot be earlier than the second half of the 12th century, maybe even the beginning of the 13th century. A good example for comparison is the small Cluniac priory of Mont-Saint-Vincent, only 15 km away from Sanvignes, with sculptural details originating from the first third of the 12th century (capitals No: 18, 21, 24) [6, pp. 164-166.]. The carvings of Sanvignes are much more abstract and geometric, which is probably partly due to the poor quality of the stone; the "crocket" capitals are clearly early gothic. Since these capitals are inseparable structural parts of the earliest part of the church, this pushes the origin of the whole building forward: towards the turn of the 13th century. We are inclined to believe, that the earliest mentions of the church from the beginning of the 12th century refer to an earlier building.

6 Summary of conclusions and a hypothetical relative periodisation of the building

The described observations and investigations enabled us to create a hypothetical periodisation of the different constructional parts of the church of Sanvignes. Figs. 8,9,10 and 11 illustrate these findings.

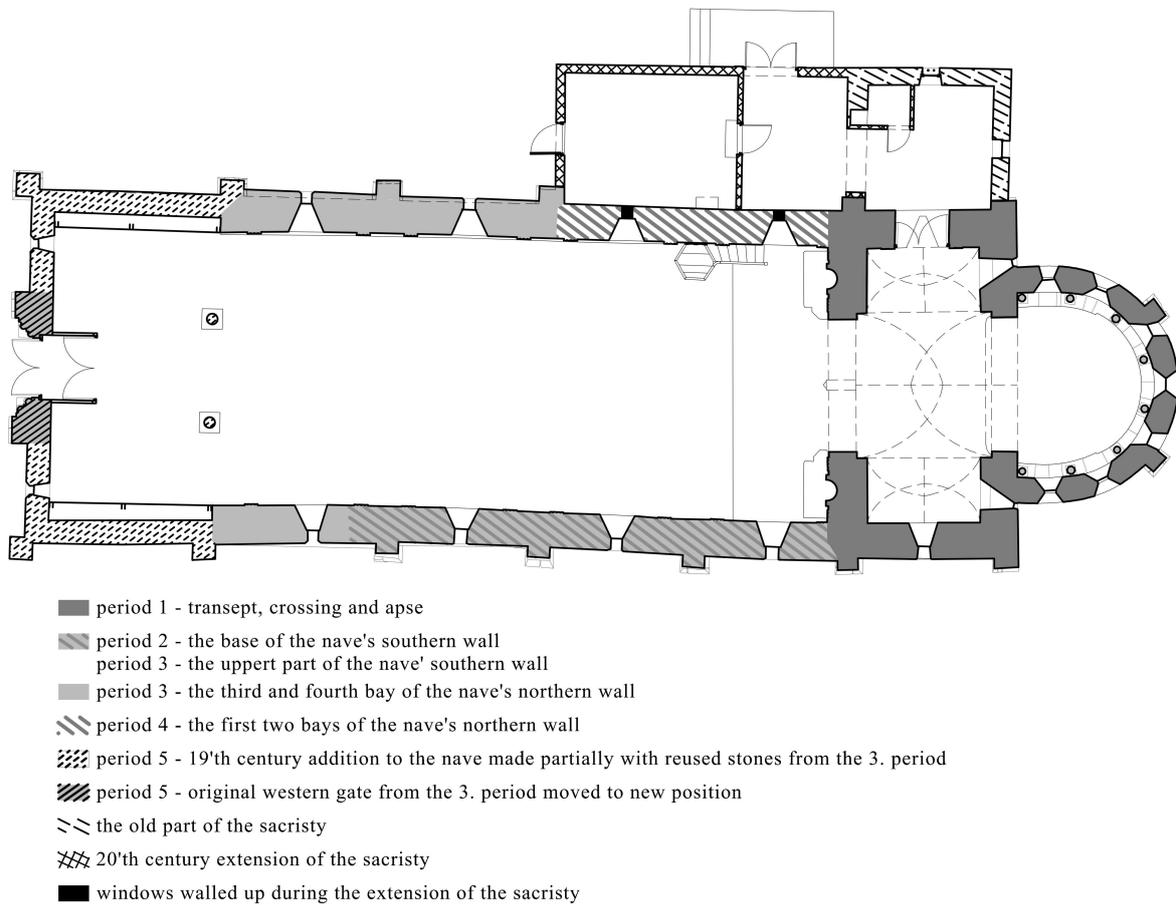


Fig. 9. Hypothetical periodisation of the church of Sanvignes, ground plan.

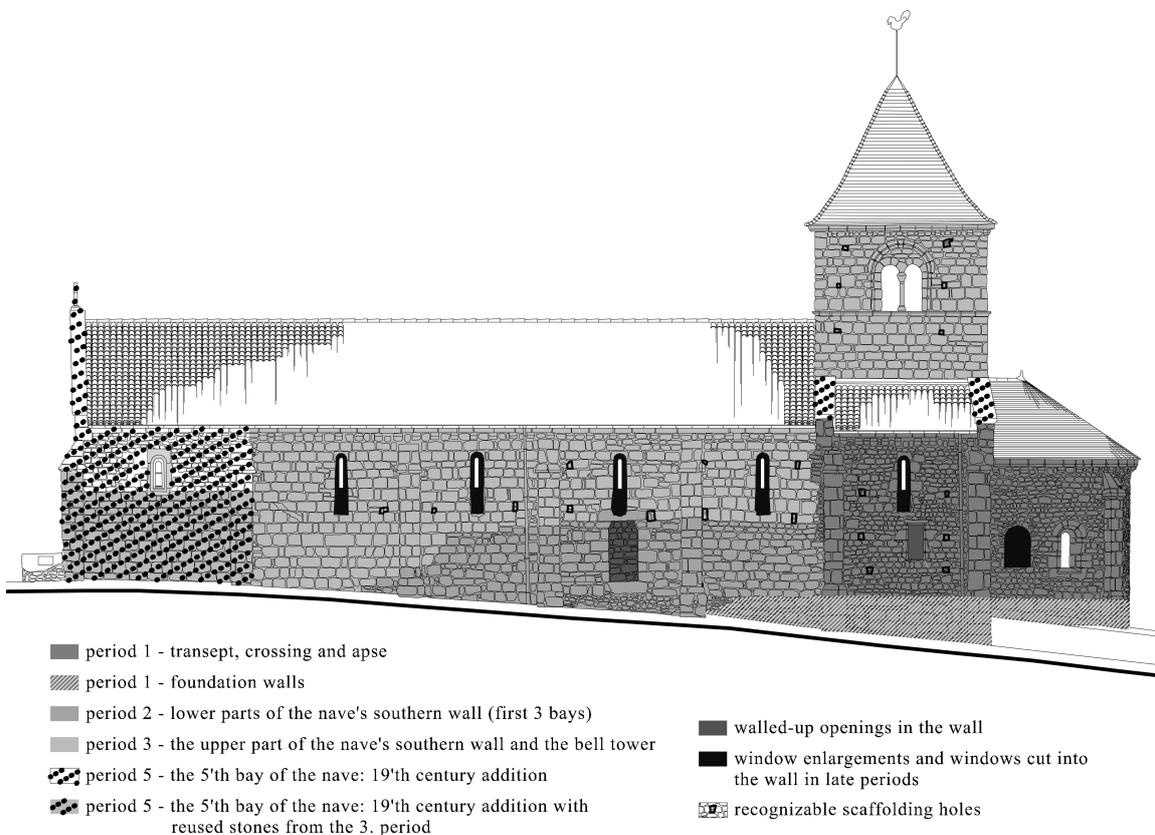


Fig. 10. Hypothetical periodisation of the church of Sanvignes, southern facade.

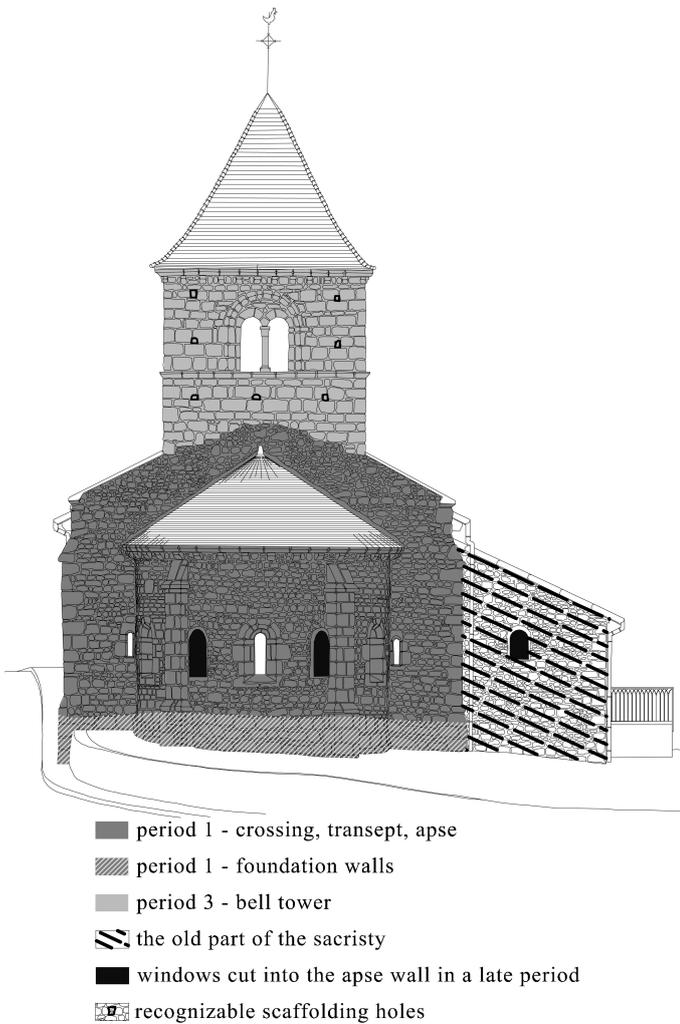


Fig. 11. Hypothetical periodisation of the church of Sanvignes, eastern facade.

Period 1) The oldest parts of the church are unquestionably the transept, the crossing and the apse. The bell tower had not yet been built and the whole transept was probably covered by a single gable roof with the ridge pointing lengthwise. Whether Period 1 had an original nave is an open question.

Period 2) The bottom parts of the nave's southern wall belong to this period, and they are clearly a separate construction from Period 1. These walls already show the shifting of the constructional grid. The shape of the wall indicates that this constructional phase was simply not finished, perhaps due to insufficient funding.

Period 3) This period consists of the upper parts of the nave's second wall, the 3rd and 4th bay of the northern wall, the original western wall of which only the gateway remains, and the bell tower. Comparing the sculptured parts of the western gate and the apse, it is probable that the first three building periods followed each with relatively short intervals. The differences in the wall textures of these parts could be the result of different masonry workshops, otherwise the result is architecturally quite coherent.

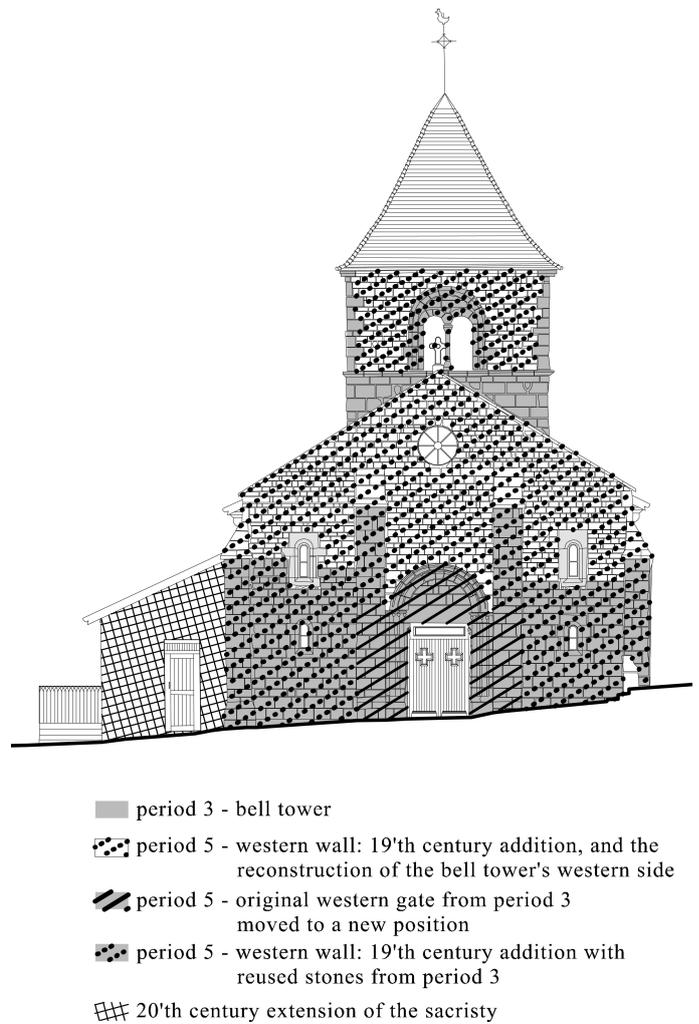


Fig. 12. Hypothetical periodisation of the church of Sanvignes, western facade.

The tilting of the walls suggests that the problems with the nave's foundations started at this point, since the tilting during the southern wall's 2nd and 3rd period is quite homogeneous. Nevertheless, the nave must have suffered significant damage.

Period 4) The 1st and 2nd bay of the nave's northern wall is a later substitution, which is revealed by the analysis of the wall tilting. The original wall probably had to be demolished because of the deformations. The age of this substitution is unclear. The masonry mimics the medieval wall of the transept, and it is certainly not a 19th century construction. It is possible that it belongs to the 1788 reconstruction works.

Sacristy 1) The old part of the sacristy was built sometime during the 19th century at the northern end of the transept; the northern window had to be walled-in. The sacristy's unplastered eastern wall suggests that it tried to mimic the medieval masonry of Period 1. The eastern window appears to be of a later origin, the original door probably faced westward.

Period 5) The extension of the nave belongs to this period: the last bays of the nave's longitudinal wall, the wooden gallery, the new western facade and the reconstruction of the bell

tower's western side. The old western facade was probably demolished to give way for the extension, and some of the stone material was reused in the new constructions. According to the few written documents and the old survey plans depicting the church, this took place towards the end of the 19th century.

The enlargement of the medieval windows and the opening of the apses four additional windows probably took place at this point, along with their glazing.

Sacristy 2) The extension of the sacristy is a fairly recent 20th century construction. The first two windows of the nave's northern wall had to be walled-in and the first buttress chiselled away.

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