

Structural Arguments in the Analysis and Conservation of Some Romanesque Churches in Romania

L. Roşiu

University "Politehnica" of Timișoara, Faculty of Architecture, Department of Architecture, Timișoara, Romania

ABSTRACT: One of the most interesting categories of historical monuments in Romania is that of the early medieval churches. However much studied, their evolutions still have been incompletely clarified. The structural analysis can offer some answers in the controversy about their history, discovering the patterns and specific features. From the prototypes of the Romanesque churches, there were chosen to be analysed the most significant cases of small single nave churches from the 13th century, trying to emphasize the importance of the structural analysis for their evolutions and for the conservation solutions.

1 STRUCTURAL FEATURES AS HISTORICAL RESEARCH ELEMENTS

1.1 Importance of structural analysis

Archaeology and sometimes ancient authors' writings or stylistic analyses are often sources of information about the evolution of a historical monument. Archaeology is considered an indispensable way, especially in dating the cultural heritage and discovering how it was transformed. It also decodes the architectural form, their migration and influences, but can not explain them. Different skilled domains may complete the knowledge in order to understand the monuments and to ground their protection.

One of them is the structural study, which tries to find the constructive thinking and how it has generated a certain architectural form. It also can help to solve some of the central problems of any study, like that of the genesis and of the influences. No matter how much studied, the Romanian Romanesque churches are still incompletely clarified, and are waiting for new possible answers in the controversy about their evolution. For a long time, the architectural and stylistic detail has been a principal criterion to appreciate the Romanesque churches. Structure is also an important element to be taken into account. Even if it can not offer accurate dating of the buildings, the structural study explains the pattern, the reasons of a certain configuration, limiting the variety of interpretations.

Therefore, the structural analysis may also become part of the historical research, completing or sustaining different hypothesis of building evolution. It could also be useful for the research of the Romanian Romanesque heritage which still has some incompletely clarified monuments in their history.

The early medieval churches form one of the most interesting categories of historical monuments in Romania. In the early Middle Ages they have been specific for Transylvania, which is northwest from the Carpathian range, while the Byzantine patterns have been used specifically in the southern region. The Romanesque influences came in Transylvania in two ways. One was the Hungarian penetration between mid 11th century and the 13th century, and the other was the colonization of the Saxons in the 12th century. The process corresponds to the period of the establishment of feudal relations and in terms of architecture it brought along some patterns of

Romanesque buildings existing in Hungarian Kingdom and in the German territories. These tendencies overlapped the local architectural features, resulting in some interesting solutions.

1.2 *Types of Romanesque churches in Romania*

Although the Romanesque in Transylvania is less spectacular because of the lack of great basilicas, destroyed or transformed in the Gothic period, this pattern offers yet two types of churches. One is the basilica with rectangular choir, apse and chapels at the end of the lateral aisles. Some examples of Cisnădioara, Turnișor, Gușterița represent the oldest group of these Saxon basilicas. The other came in the 13th century from the Hungarian Benedictine church and consists in a basilica with a single apse, like those of Herina or Acîș. (Fig. 1) Part of the basilicas disappeared and offer information as archaeological sites. A small number keeps the wooden structure of the ceiling, most of them receiving cross-vaults in the Gothic period.

Another pattern, still preserved in the Romanesque architecture is that of the one nave church. This type, well conserved in the area of the Hațeg county has been considered the oldest and the most important group of Romanian medieval monuments because of the architectural value, the structural conception and the documentary information for the reconstitution of the medieval civilization (Popa, 1988). They can be classified in some main types, but there are also exceptions to be found, special cases that give original solutions. This pattern of churches was used for the court chapels, for parish churches or monasteries.

One type is that of a simple plan with a rectangular nave and an apse in semicircle without any tower (Examples at Nucșoara, Ostrovu Mare – first phase). Another type completes the plan with a small pronaos superposed by a squared tower on the west side. In spite of being of small dimensions, these churches have thick stone walls, about 70 - 100 cm, barrel-vaults or wooden boards in the nave and cross-vaults or half-dome structure in the apse. Another type of this category of Romanesque churches is that of the central plan. Present in Hungarian and Slave territories and in German and Austrian areas as a cemetery chapel, it is a frequent solution for mausoleums and baptisteries (Vătășianu, 2001). It has the prototype of a domed central unit with an ambulatory around. In Transylvania it is represented by two kinds of plan: the rotunda with an apse and the four or six lobed chapel. The cover of the nave was frequently wooden board and over the choir there was a vault. (Examples at Pelișor, Geoagiu de Jos, Odorhei). There are also some unique churches that can not be included in this typology. They are considered atypical forms with ingenious solutions because of their structure and high architectural value. A particular note is to be made here of the court chapels from Streisângiorgiu and Densus.



Figure 1 : The basilica of Herina

1.3 Structural behaviour, an answer to historical questions

Let us take the case of the oldest church from the Haţeg area, the court chapel of Streisângiorgiu. (Fig. 2) It is archaeological dated from the first half of the 12th century, when it replaced a wooden church on the same place (Popa, 1988). The simplicity of the plan makes possible the analysis of a basic structure of a Romanesque church. It has a nave of 4.60 x 4.70 m and a rectangular choir of 3.20 x 2.80 m. In the 16th century a wooden pronaos was added to the west façade, which turned into a masonry structure in the 19th century (Popa, 1988). The walls, thick of almost 1 m, are made of stone, of ashlars spoiled from Roman ruins and bricks. The nave has a barrel-vault and the choir a domical-vault. The tower, crossing the vault, leans on the west wall and on two pillars dating from the same period as the walls. (Fig. 3)

The main unsolved problems of the church are the date of the tower and the role of the two pilasters of the nave. The first form of the church has been considered uncertain, several painted inscriptions indicating phases of rebuilt. The presence of the two pillars has been attributed to an initial tribune for the founder, but their dimension seems to confirm an initial intent to build a tower. The conclusion comes by comparing the pillars of the west side of the nave, with a dimension of about 70 x 70 cm with the structural necessity of a supposed tribune and with other similar constructions, like, for instance, the ruin of the court chapel of Ilidia or the church of Sântămărie Orlea, the first with very strong pillars in the west side of the nave, and the latter with smaller sections and with a certain destination of the pillars for the tribune. Considering also the role of the tower as a place to observe the zone, we can argue the possibility of its existence from the first period of the church, and not from a later date, 1408, when the church became a monastery and the tower was testified by the votive painting.



Figure 2 : The church of Streisângiorgiu

Also the two pilasters of the nave, with a correspondence in two counterforts outside, have lead some authors to the supposition of an initial dwelling tower above the nave, although there was no trace to be found. Yet they drew their conclusion in accordance with some other similar examples in the zone, of a century later. (Popa, 1988) Other opinions appreciate the pilasters sustaining an arch and fragmenting the vault into distinct areas, as elements of a simplified Romanesque pattern (Moisescu, 2001). The two different levels of the nave barrel-vault have been also attributed to an intention of pointing out a choir between the nave and the rectangular altar apse (Ionescu, 1982). The reason of the two counterforts is given of the practice of the counterfort itself in the Romanesque architecture, where it is used in correspondence with a strengthening arch and with the pilaster at the interior. This system could be brought here from a Benedictine pattern in order to detach the choir. So, the necessity of a separation of the nave in two bays using an arch may be simply the reason of the two counterforts.

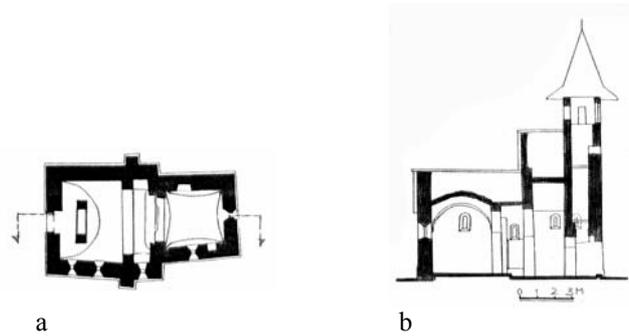


Figure 3 : The church of Streisângiorgiu a plan, b. section

The structure of the four lobed church of Gurasada, corresponding to the first period of the monument, is composed by two lateral apses framing other two extended apses oriented east-west, with a tower above their crossing. All the space is vaulted, in the side apses with a half-dome and with elliptical calottes for the longitudinal apses. The tower is also covered by an elliptical calotte. The church is made of quarry with hydraulic mortar, rich in brick powder. Researchers appreciate that this structure dates from the second half of the 13th century, but they are supposed to be from an earlier time. (Popa, 1988). A three nave pronaos was probably later added to the west side of the church, with barrel vaulted interiors. The traces of four pillars for tower correspond to the central bay of the pronaos and could indicate an earlier space on the west façade (Moiescu, 2001). The last addition, the tower before the pronaos, documentary testified, was built in 1765. These phases have been put in relation with an initial court chapel or with a small monastery, which would justify the large pronaos. (Fig. 4)

The structure proves a good knowledge of materials, the hydraulic mortar being used at a high level. In spite of a clumsy vault technique of the tower, its footing was done on the four vaults without any arch. This unusual mode of removal the loads detaches this church from any supposed south Byzantine influence that would suppose a crossing of barrel-vaults or arches and pendentives. The disposal of the stone is typical for a cupola, not for a barrel-vault and betrays the structural thinking of the builder, who followed another model, not the Byzantine one. Some authors assume the church is older than the 13th century, referring at a possible role of court chapel (Popa, 1988). Existing in the Roman heritage, that begins in the early Christian cemetery chapel, the prototype could be used here also for such a destination, its dedication to Saint Michael being specific for this use (Vătăşianu, 1967). The church could be also the result of a west Romanesque influence from the Hungarian or German pattern of the 12th and 13th centuries.

Another structural element to be taken in account is the springing of a vault upon the pronaos arches, which confirms by a structural element an initial phase, when the church seems to have had an addition on the west façade. While some researchers explain the simultaneity of the three nave pronaos with the four lobed church by presumptive functions, the structural argument shows that beyond any doubt.

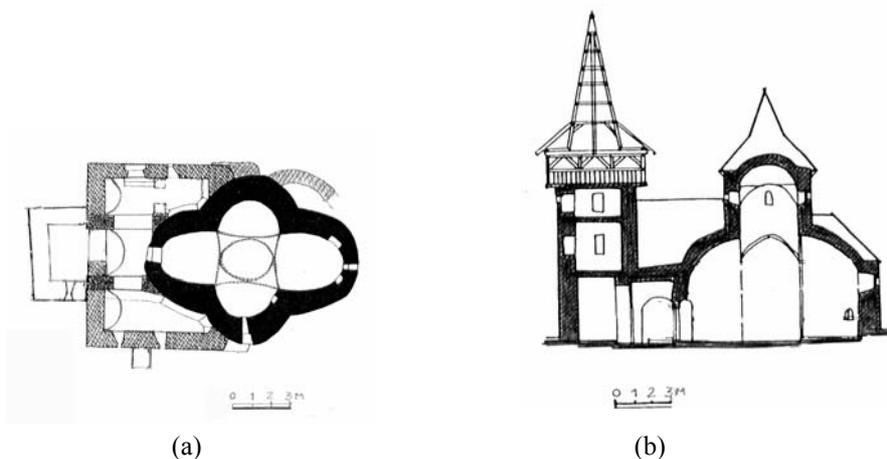


Figure 4 : The church of Gurasada, (a) plan, (b) section

1.4 The problem of the pattern

The church of Strei, another type of Romanesque church was built after the pattern of Sântămărie Orlea about in the year 1300. (Fig. 5) First, it was also a court chapel. The tower is here added to the west façade and has the base covered in a barrel-vault. It ends at the top in a calotte realized by circular rows of stone resulting in a conical vault as interior of the stone roof. The nave is 4.80 x 6.50 m and has had a wooden board transformed now in a wooden barrel-vault. The rectangular choir maintains its cross-vault on ogival system. In the 19th century, the west façade was continued with a small pronaos including the base of the tower. Other transformations were a second nave built on the north side, later demolished in the 19th century and a covered entrance on the south façade. The model came from Sântămărie Orlea, a parish church for the Catholic community serving the local fortress. The pattern with a nave of 8.50 x 14.20 m covered by a wooden floor has an ogival vault in the choir. In both cases the towers, main pieces of the church, received a tribune at the base. That of Sântămărie Orlea lies on two octogonal pillars considered by some authors as dating from the beginning of the church, and by others from the 15th century. (Popa, 1988) In both cases the structural element has an important role in the appreciation of the initial phase of construction, especially the vault structure and the tower configuration.



Figure 5 : The church of Strei

The most interesting structural problems appear at the church of Densuş. The Saint Nicholas church has an almost squared nave of 6.40 x 6.25 m and a semicircular apse of 3 m depth. The tower raises in the middle of the nave resting on four pillars made each of them of two Roman altars and bent together with arches. Other spaces have completed this nucleus. (Fig. 6) A sacristy and a lateral room on the south side have been considered by some researchers as later additions and by others, from the same period with the church (Moisescu, 2001). Only the large pronaos was surely built in the 15th century. The main problem of this monument, which is considered one of the most original and valuable cases in the early Romanian medieval architecture especially because of its structure, does not lie only in the building date of the church.

It has an atypical solution for a church of the 13th century. The four pillars of the tower, placed in a square of about 3.00 x 3.00 m, are an independent structure, being not bent to the exterior walls, however there is a small barrel-vault conceived as the cover of an ambulatory around. The tower has a hiding place above the nave and another room accessible from outside at the upper level, under the conical stone roof. The altar has a barrel-vault ended in a calotte, the sacristy a barrel-vault in superposed rows and the lateral room, almost demolished, shows traces of a barrel-vault in radial arrangement of the stone. The structure of the walls has been made of quarry, and of ashlar, altars with inscriptions, parts of columns, all brought from Roman monuments. This building occasioned a lot of theories about its origins, the period of construction and the architectural influences. Some of the ideas have been removed, like the reuse

of a Roman ruined construction (a mausoleum or a temple), because of the Roman material casually disposed at the

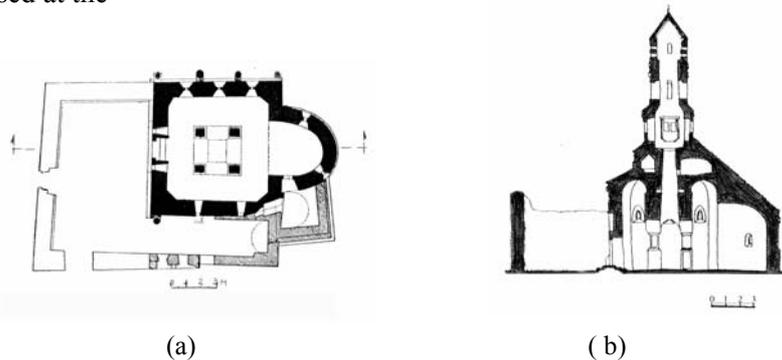


Figure 6 : The church of Densuș, (a) plan, (b) section

base of the walls (Rusu, 1997). But it proves the direct relation with the Roman heritage, abundant in the early Middle Ages in the area. The presence of four columns from antique monuments on each lateral side of the nave shows a Roman source of inspiration. These columns have been arranged like the counterforts but seem to be only decorative elements, having no relation with the level of the vaults and their springing. This is proof that the builders followed a model from the roman architecture, without understanding its structural laws very well.

Trying to explain this unique monument, some researchers have suggested a relation between the Byzantine plan of the inscribed Greek cross, pointing out, however, the lack of correspondence between the axis of the pillars and the opening of the apse. If the plan might have an appearance of a Byzantine type, the structure has nothing in common with a Byzantine conception. Anyway the builders seem never to have seen a Byzantine church (Vătășianu, 2001). Then, which was the model? Some details show Romanesque influences at the roof of the tower, at the windows or in the brick decoration in zigzag. (Fig. 7) But the most important argument comes from the mode of the removal of the tower loads. Crossing of barrel-vaults or pendentives are missing and the loads are directly removed to the four pillars. There is a similarity with a structural model of a Roman construction with the same components and structural behaviour: the mausoleum or the Roman tomb. It consists of a central nucleus, a recess where the urn with ashes was deposited, framed by four pillars sustaining on the top a statue or a funeral symbol of the deceased. The proximity of Ulpia Traiana, the capital of the territory during the Roman power (106 – 274), would offer a lot of models at the beginning of the development of the medieval society. A local example of a survived roman tomb could be taken as an adaptable pattern for a small court or cemetery chapel. Therefore, the pattern may become an useful instrument of study.

The structural argument is here less a way to date or to appreciate the functional role of a building, but a help to understand the specificity of a monument, to point out the important features in order to stress them through the conservation and protection measures.



Figure 7 : The church of Densuș

2 STRUCTURAL ARGUMENTS IN THE CONSERVATION

2.1 *General tendencies*

An important series of restoration works have been applied to this category of early medieval monuments in the 7th decade of the last century and has imposed the image these churches still have. They tried to emphasize the specific features of each monument by choosing the right principle to be applied. Generally, the interventions were completions and reconstitution of some elements, removals and consolidations. According to the principles of the Venice Chart, considering as a strong reason the high value of the monument, any remade insufficiently documented on attested information has been refused. The different structural prototypes have also conditioned the conservation methodology. On the other hand, the inner painting or the presence of some Roman stones in the wall configuration, inscribed sometimes and the ornamental details, have added other specific conditions. All these constraints have lead to the current image of these monuments as a result of the choice of a solution, which tried to emphasize the most important features.

In this sense the structural analysis has been particularly useful. The restoration has created the contemporary perception of the monuments, proposing a sort of reading of its history, which yet does not justify a change of image. Therefore no other restoration work is needed, only conservation operations. As a general tendency, the restoration work has tried to put forward the evolution of these churches, stressing the phases of their history by the structural expressivity. It has been applied differently, because in some situations, the last additions were considered not representative. So, each church became a special case with a particular manner of applying the same principles.

At Streisângiorgiu, for example, the wooden pronaos built in the 16th century and rebuilt in the 19th, has been demolished without marking its perimeter, according the restoration principles. The solution tried to emphasize the medieval structure, hidden and minimized by the former addition. The same case has been solved completely differently at Gurasada, where the last phase, the tower built in the 18th century, has been maintained. This decision preserved the final picturesque image of the monument, but also accepted the duality of the two dominant towers. On the other side, the only good angle to perceive the old structure is from the altar side and the site does not offer a wide perspective to include the whole monument.

A middle solution has been preferred at Densuş, where the central nucleus with the altar and the sacristy have been restored by completions and repairs and the lateral room and the last added pronaos from the 15th century have been conserved as ruins. (Fig.8) The reason was to detach the old structure. This possibility of choice could have some explanations. Keeping the ruins as a part of the monument marks its history, but also permits the best perspective of the monument. At the same time, unimportant additions that may disappear are not marked in order to prevent confusion with a valuable decayed element. Such is the case of the church of Strei, where the pronaos of the 15th century, ruined in the 17th century, has been restored as a ruin, but the chapel of the north side and the covered entrance of the south façade, late additions, have not been marked any more.



Figure 8 : Church of Densuş, north side

2.2 The relation form - structure

The decision to emphasize some elements or others is easier to be taken with the help of the structural argument, which can offer specific reasons to stress characteristic parts. Thus may be explained the apparent vault at the church of Gurasada. Such a fashion has dominated the restoration of the second half of the 20th century, with a strong tendency to express the structure. However it does not correspond to the initial image of the interior space or of the façades, this kind of treatment gives more information about the building trade in the 13th century, about the structural qualities of the monument and facilitates the approach to its history. The same signification has the fragment of vault on the south side of the church of Densuş, reconstituted as a testifier of the structural qualities of the vault. So, the restoration of the church of Densuş has proposed a lecture of its structure from the finite image of the old nucleus, to a section through the intermediary phase and finally to the decayed structure of the last phase.

The reconstitution as mode of completion of an element has been accepted only when all information for a remade has been obtained. The most spectacular and significant element for the architectural shape is the tower of these churches, especially the stone helm. At Densuş, Streisângeorgiu, Gurasada these roofs have been reshaped according some information like those of the votive picture or the details found "in situ". So, the church of Densuş received the new form of the roof after the discovery of the traces of roofing slates on the extrados of the vaults. It lead to a remade of the form and material, with the stone roof placed directly on the vaults extrados instead of the tiled roof with wooden frame. The solution of the period, with an overconcreting of the vault has produced damages to the interior paintings and the church had to be repaired. But the general shape imposed by the main restoration, has been maintained. The tower structure was also consolidated by a reinforced-concrete plate bent with the hidden capping at the level of the cornice and at the base of the tower (Curinschi Vorona, 1995). Although contested, the solution tried to consolidate the weak points of the monument outlined by the structural study.

3 CONCLUSIONS

Structural analysis is usually demanded to solve the direct problems of the stability of the buildings. Rarely does it contribute with answers to their history to explain the architecture, the migration of influences, to sustain the artistic reasons of the building components. For the Romanesque small churches from the zone of Haţeg, this kind of analysis brings some advantages:

- It offers a better knowledge to be used in the conservation work and gives specific reasons to the choice of the restoration solution.
- Brings clarifications in the dispute about the evolution of these churches.
- Contributes to the understanding of the authenticity and originality of these monuments.
- Proposes the model as a global instrument of study, showing its benefit in the research, instead of, or complement to the system of analogy between independent elements.

So, it is justified to reconsider the role of the structural analysis in a more extended domain of the research and protection of the built heritage

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