

Building Techniques and Materials used by Moldavian Ecclesiastical Architecture during the 14th-16th centuries

Abstract

“Any historical research is, by definition, a retrospective one. Any causal inquiry is, therefore, regressive. Thus, a historian begins with the effect and follows through until he/ she reaches the antecedent.” (Aron, 1997, 199). According to this line of thought one can state that in order to find the antecedents, causes or motivations leading to a historical event, one should start with the mechanics causing the effects or, in other words, by starting with the sum of effects one should reach a case file of causes.

The all-comprehensive statement above becomes useful when applied to various real historical circumstances. For a historian, art and architecture represent essential expressions of a dynamic society that evolve according to the social, political and economic context that influences it. (Rusu, 2022, 264). As for our thesis, the algorithm presented above was applied to several Moldavian medieval history cases in order ***to establish the causes that determined the necessity, the building craft and the opportunity of further interventions*** upon the structure and appearance of the churches built during that period. Discussing algorithms also means discussing rules (Daston, 2025, 13). Were there any rules applied for the construction of medieval churches? We wonder if the scholastic assertions about the medieval architecture in Moldavia between the 14th and 16th centuries are based upon this mechanism. In this context is it possible that the challenges of historical researches would shake several certainties that have been governing the conclusions and hypotheses formulated until nowadays?

Ecclesiastical architecture is quintessentially symbolic and cannot be understood without a good knowledge and thorough grasping of the spiritual values attached to the religion that birthed it. A church is composed from inside out, according to its rituals and prayers. The message of this composition is revealed to the chosen ones and it reaches the beholder like the feeling of a deeper existence through a magic that appeals to the subconscious life (Crişan, 1997, 7).

Our thesis focuses on the heyday of ecclesiastical architecture in Moldavia starting from the second half of the 14th century and finishing with the first half of the 16th century. During that time, the contributions of Moldavian rulers, such as Bogdan I, Petru I, Alexandru cel Bun, Ştefan cel Mare and Petru Rareş outlined an era of maximum progress and triggered a unique style in Romanian architecture, characterized by many original features but also sharing similarities with the architecture of medieval neighbour states.

Nevertheless, in order to understand the characteristics of Romanian ecclesiastical architecture, one should consider the succession of civilizations formed in or influencing the area of the Extra-Carpathian space. Placed at the cultural junction of two great architectural movements, the Byzantine and the Western European, the Romanian architectural creation of the 14th-16th centuries is rooted in these cultures and located inside the influential area of the cultural movements that shaped the bases of church building in the aforementioned areas.

If clerical architecture in Wallachia chose to rely mainly upon the Byzantine architectural style, in Moldavia, the Western influences were more vivid and their elements entered the latter geographical space with the help of Transylvanian master builders. In this area, Gothic-type architectural elements and constructive principles were preserved and even developed, leading to a synthetic construction with original elements, grafted on a Byzantine plan imposed by the Orthodox cult. The external image of these constructions is shown to advantage by the composition of the volumes and the treatment of the facades, thus becoming the field of excellence for the free creation of the craftsmen unhindered by dogmatic constraints. Disposing of few building materials – stone and wood, the builders chose for the composition of the architectural plan a church adapted to local climate requirements, resulting in a functional construction that fulfilled both its fundamental role, that of religious space, as well as that of public utility – if we refer to the destination and role of the church in times of trouble.

The buildings of medieval Moldavia, whether made of wood or stone, represent a ***historical testimony***. For various reasons, these constructions have undergone structural and architectural changes that have completed the images we see nowadays. In analysing the evolution of a church, violent events such as natural disasters have often been neglected. Under these circumstances, what could have been the journey of such an edifice over the years, architecturally speaking? Has it been transformed/ altered after numerous fires or repeated earthquakes? What were those alterations about? Which were the social, political and economic premises that led to them? What were the stages of execution and what craftsmen put them into practice? Did they have trade secrets? If they had, can they be found? These are just a few questions we have tried to answer in this paper.

After completing the research for this thesis concerning the building materials and techniques used during that period by the craftsmen in order to build the churches in Moldavia, we reached the conclusion that ***the main influence in the construction of these churches is most likely to have come from the sphere of Western Europe***. Subsequent to the migrations of German populations from the areas of Bohemia and Moravia, the building concepts and the techniques used by the craftsmen in those areas found a favourable development ground in

Transylvania. The trade between Transylvanian merchants and those over the mountains, as well as the migration of a population segment of Germanic origin from Transylvania to the less developed area of the young Moldavian state made it possible for the information regarding church building to enter this area as well. As a result, at the request of the voivodes from Moldova, places of worship with such elements were built in this area as well.

During our research we focused on the following churches in the northern area of Moldavia, built since the first half of the 14th century until the middle of the 16th century:

Bogdana-Rădăuți Monastery Church, Săbăoani Church, Giuliesti Church, the Catholic Church in Baia, “Ascension of the Lord” Church in Lujeni, Dolhești Church, Bălinești Church, Siret Church, the Old Church in Volovăț, Mirauti Church, the Old Church of Humor Monastery, the Old Church of Moldovița Monastery, the Old Church of Putna Monastery, Pătrăuți Church, Șcheia Church, Voroneț Monastery Church, Hârlău Church, Borzesti Church, Popăuți Monastery Church, Tazlău Monastery Church, Neamț Monastery Church, New Church from Volovăț, Arbore Church, Reuseni Church, Dobrovăț Monastery Church, Păhăuți Church, New Church of Humor Monastery, Church of Probota Monastery, New Church of Moldovița Monastery, Church of Baia (Petru Rareș), Church of Saint Dumitru-Suceava.

The topic of our thesis required a type of research conducted on several levels. A first level focused upon the analysis of all the documentary, narrative and archaeological sources, as well as on the specific literature in the field. The aim of this approach was to obtain information on the locations, building modalities, the type of materials and building techniques used and the overall structural design of these churches. The second level consisted of a direct analysis of the investigated buildings using the techniques of 3D scanning, photogrammetry and infrared scanning. The purpose of these explorations was to obtain a descriptive report, as accurate as possible, that would offer us references regarding the concept of construction as well as information about the structural elements, the building techniques put to work, the actual dimensions of the buildings, the execution faults or their subsequent repairs.

The study of the churches in Moldova led to the conclusion that these edifices distinguish themselves through a trilobate, triconch or basilical building layout. This specific configuration, seems to endow them with their own rules pertaining to the relations between sides and heights that can be found in the general theory of proportions (Radian, 1981.164). Their general characteristic, which becomes a dominant one, is the presence of a “centre of gravity” – the nave, the place best featured, through the presence of the central vault, in which we find the iconography of a blessing Jesus Christ – Christ Pantocrator. According to the social, demographic or political conditions, the basic structure of the church was improved functionally or symbolically, either by changes in the dimensions of the interior spaces or by additions of

new volumes with clear functions, such as the crypt or the exonarthex. The first, defined as a burial space intended for the founder of the church and his family, is a distinct room, positioned between the nave and the narthex. The exonarthex, or porch, is another room that changes the spatial composition of the building that leads to a change in the planning dimensions of the church.

We believe that Moldavian churches erected during the 14th – 16th centuries should be looked upon and analysed in the context of political and social changes of the Moldavian society, their architectural and building evolution having a dynamic character. At the same time, the clerical buildings of this period bear the mark of a society, which, from the point of view of the populations that lived in the area, had a heterogeneous character and, also, imply an evolution of the level of professional qualification for the master builders who crafted such works.

One of the major challenges of the research topic is the fact that the building materials and techniques used during this period, although not much different, have, however, evolved in close relation with the level of qualification of the craftsmen who built the churches. Thus rises the pertinent question whether the churches we studied had originally the same image we see nowadays or they have been architecturally altered. This line of thinking can lead us to the history of every monument that suffered from a devastating fire or a powerful earthquake. If the monument suffered because of these events, what were the solutions found by the master builders in order to repair it? Therefore, a new objective was outlined, whose goal was to identify the various stages with their subsequent materials and execution techniques that marked the architectural/ building evolution of a church based on the data issued from archaeological research reports and the information obtained through measurements made with new scanning techniques.

The main research method used in our endeavour was the comparative one that generated several work hypotheses. The final results shaped an image of a possible historical journey of a monument and its execution stages, as well as the evolution of the master builders who executed the works. We believe that the result of this research is useful for all stages of any restoration project, as well as for all the specialists involved, in order to reach a final product as close to the original historic monument as possible.

The systematic analysis of the information gathered for the period between the second half of the 14th century and the beginning of the reign of Ștefan cel Mare (1457-1504) outlines,

from a constructive and architectural point of view, two church layouts – the hall type layout and the trilobate layout

Among the churches with **hall type layout** there are the church of Saint Nicholas Bogdana, the church of Giulești and the church of Săbăoani. All these edifices were built during the second half of the 14th century and have several common points in terms of location, they. The churches of Bogdana-Rădăuți and Săbăoani are located on the sites of older wooden churches. Regarding the layout, they are compartmentalised into altar, nave and narthex, representing examples of adaptation of a hall-type church to a Byzantine model. The altar found in this type of church is polygonal (Săbăoani, Giulești), it features buttresses and shows an offset from the church nave. The foundations are made of stone blocks connected with lime mortar. The foundation footing is located at depths between 0.50-1,20m. If the church ground featured a slope or the level of the groundwater was high, the master builders used a special type of foundations, made up of stakes and slab wood fixed in the ground, upon which the main foundation was raised.

A relevant example for this type of foundation is found at the church in Săbăoani, where the builders used what we might call “pilots” nowadays, made out of slaked lime and tree branches placed in a pit as reinforcement. This foundation is a testimony to the fact that the craftsmen who executed these works came or had knowledge from an area where land with such problems was found and practiced this type of foundations in lay or ecclesiastical constructions. The elevations of the churches are made from a masonry of rubble stones orderly placed in courses, using mortar made of quenched lime as a connecting element. At the top, they are finished with a pedestal made of shaped stone with a trapezoidal section.

The second type of layout, also known as the **trilobate layout**, appeared in a historical context that birthed another stage in Byzantine architecture. That is the last stage of the revival of Byzantine art, which took place after the conquest of Constantinople, following the Fourth Crusade in 1204, and its abandonment in 1261. With strong architectural roots in the area of Georgia and Armenia and under the influence of regional adaptations, a new, original architectural style was created, also known as the Byzantine style. The dogma of the Holy Trinity was probably the foundation of the concept that triggered the apparition of this new type of church layout. It was born on Mount Athos from where it spread among churches in the Balkans. The Serbs and the Bulgarians adopted this new style that also tended to revert to older, more traditional forms.

Vertically, this layout illustrates how the altar and the nave perform the image of dualism defined by the earthly world and the celestial world. Horizontally, two well-defined spaces take

shape, separated by the iconostasis. The altar appears in the layout as a semicircle also called the apse of the altar and becomes the place for celebrating the religious service, intended exclusively for priests. The nave is represented as a rectangle located in front of the iconostasis, which ends on the North and South sides with two semicircles called the apses of the nave. This space is the place where priests interact with the faithful during the liturgy (Dordea-Voitec, 2004, 27).

The apses are covered with a masonry structure shaped as a half-dome called the conch. The altar and the nave would appear in the layout forming a cross from which the Greek cross layout and the Latin cross layout would evolve. Over it, builders would elevate tall and slender drums covered by domes or towers. The facades are polychrome and decorated with registers where stone and brick alternate.

As a reflection of the Balkan buildings, *the model of the trilobate layout* is adopted for the first time in Moldavia, where we can find it at the church in Siret and at the Church of Holy Friday in Roman.

Mainly, this type of layout probably entered Moldavia through two “channels.” A first “channel” that made possible a connection with the space of Wallachia could have appeared with the help of the monks educated by Nicodemus, who organized the North-Danube monasticism. Living on Mount Athos, where he led the Cutlumuş Monastery and then became a protos, he took from the Athonite space the model of a monastery that represented the nucleus of the Eastern type medieval civilization and implemented it in the North-Danube area by establishing the monasteries Vodiţa (1372) and Tismana (1375), thus laying the foundations of the Orthodox monasticism (Teodorescu, 1974, 223; Pannel No 45).

The second “channel” through which the model of the trilobate layout could have entered Moldavia might have been the Dobrogea space where, in 1346, there was Dobrotici, who ruled the Black Sea coast from Szopol and Varna to Dobrogea. Thus, the geographical space where he reigned was near some settlements where you can find churches that adopted the trilobate layout.

One example is the church at Niculiţel. It has a cruciform layout, without free-standing support points, and consists of a semicircular apse covered by a spherical vault, a naos with two apses and a hexagonal tower as well as a narthex covered by a barrel vault arranged along the North–South direction (Bătrîna, Bătrîna, 1977a, 531–551). The building, constructed during a period contemporary with the reign of Mircea cel Bătrân, was in fact a chapel, part of a feudal court. Here we find a feature shared with the churches of Moldavia, namely the positioning, on the Northern side of the entrance door to the church, the same as the one at the church of

Bogdana Monastery. The connections with the Moldavian area are also confirmed by excavations near Niculițel, on Bădila Hill, where a treasure containing a large number of coins issued by Mircea cel Bătrân and Petru I was discovered (Giurescu, 1942, 14).

In the Moldavian area of the 14th and 15th centuries, examples of this type of layout may be considered to be the churches at Siret, “Saint Friday” Church in Roman, the first church at Mirăuți, the first church at Volovăț, and the churches of the Humor and Moldovița Monasteries.

At both Siret and Roman, only the foundations and, partially, some of the wall masonries have survived. The layouts of the churches conform to the canons required by the compartmentalization of churches influenced by Byzantine architecture. Information concerning the foundations of the church at Siret shows that they were deeply embedded in the ground and were subsequently consolidated through underpinning works (Spinei, Gherman, 1995, 229–250). The monastery churches at Humor and Moldovița, built during the reign of Alexandru cel Bun, introduced a new vision of construction. These new solutions may also have been due to the arrival in Moldavia of Protestant communities from Bohemia that found shelter in the state ruled by Alexandru cel Bun. Perhaps these were also the “roots” of communities that later, beginning with the reign of Ștefan cel Mare (1457–1504), generated a migration of labour force from Bohemia to Moldavia.

A first construction phase consisted of building the altar and the nave, followed subsequently by the construction of other rooms, such as the burial chamber/ crypt. In the case of the church at Moldovița, because it was situated near a hill crossed by a small stream, the foundations were built in trenches excavated to a depth of 85–90 cm below the natural ground level and were supported on a network of wooden stakes 6–7 cm thick, placed at intervals of 10–20 cm (Cantacuzino, 1971, 81). We want to emphasize here the similarities, from the point of view of building technique, with the foundations at Niculițel. With the construction of these churches, the issue of the crypt emerged. This is a room, part of the church layout, where the graves of prominent persons or members of a monastic community were located. The burial of prominent lay figures inside a church was not a new issue in Moldavian ecclesiastical architecture, being characteristic of the end of the 14th century. The first such instance is found at “Saint Friday” Church in Roman, where Anastasia, the wife of Roman I, was buried (*DRH*, A Moldova, 1975, 32). In the construction of the crypt at Moldovița, there are differences in foundation levels between the nave and the crypt.

The second stage consisted of extending the church toward the west (Teodoru, 1970, 1–6). At Moldovița, the walls were made of mountain stone, using the rubble-core wall technique. To strengthen the walls and to maintain the horizontality of the brick courses, oak timber beams

were introduced into the masonry. In addition, the tower above the nave appears here. This is attested by the testimony of Nicolae Iorga, as well as by the presence of structural elements capable of supporting the weight of the tower above the nave (Iorga, Balș, 1922, 47). The same solution was not used in the construction of the church at Humor. In response to the requirements imposed by the liturgical service, two spaces were arranged inside the altar, called *proscomidie* and *diaconicon*. The second room appeared after the building of the altar and the nave and employed a different construction technique. The new room was attached to the nave, using an enlargement of the masonry at the corners, which may confirm the use of another vaulting system. The works were completed with the construction of the exterior sidewalks, made of large stones sloping outward to divert rainwater away from the church foundations (Busuioc, Cantacuzino, 1969, 71). Thus, we may assume that, chronologically, the crypt preceded the narthex.

With the accession of Ștefan cel Mare to the throne, we witness a process of interaction between popular culture and high culture, particularly evident within ecclesiastical institutions. ***The trilobate layout evolved and the triconch layout appeared***, together with a new roofing system in the area of the nave and altar. The most important element introduced into church architecture was the tower above the nave, which rested directly on the exterior walls of the church by means of two tiers of four arches each. Their horizontal planes were arranged on the same vertical axis and rotated relative to one another around an imaginary central axis at an angle of 45 degrees. In these cases, the exterior walls were less massive. As plastic decorative elements, but also ones with a structural role, stone corbels appeared, above which the vaulting system was formed. Probably imposed for theological reasons, the tower consisted of a masonry cylinder resting on a complex structural system made up of arches and spherical triangles. Because of the thrusts generated by the tower above the naos, older architectural elements called buttresses were adopted; these formed an integral body with the stone wall and served to increase its resistance. The tower above the nave became higher and represented a technical challenge for the craftsmen. The new constructions became slenderer, representing, for those times, a qualitative technical leap.

The vaulting system composed of main arches, spherical triangles, and diagonal arches — structural elements built of stone and brick — evolved and formed a spatially unified whole. Nevertheless, this solution used by the master builders was limited by the spans of the main arches, defined by the horizontal distances between the points where the main arches sprang. These points were marked by the craftsmen with profiled stone corbels.

The constructive solutions described above developed with the accession of Ștefan cel Mare to the throne of Moldavia (Voitec-Dordea, 2004, 31). Emblematic examples from the beginning of this project are the churches at Pătrăuți (1487), Bădeuți-Milișăuți (1487), “Saint Elijah” at Șcheia (1488), and Voroneț (1488). Probably not by chance, the ruler decided that one of the first churches in this program, the one at Pătrăuți, should be dedicated to the Holy Cross, an extremely rare dedication for the Orthodox Eastern area (Dragnev, Cașu and others, 2004, 71).

The constructive principle that was absolutely new in the medieval Moldavian space consisted of the fact that the geometry of the structural forms — arches, vaults, domes, and conches — had to correspond, in vertical projection, to the supporting elements that completed the spatial configuration of the church. In this context, the profile of the elevations had to correspond to the positioning of the exterior walls over which the entire vaulting system was to be constructed. The technique of building foundations in stepped courses became a new element, confirming that the builders' level of knowledge was superior to that of those who had elevated clerical edifices up to that time.

In the case of the church at Hârlău, the two buttresses on the Northern and Southern sides are positioned eccentrically relative to the axis of the interior arch separating the narthex from the nave, as observed at the church at Tazlău. At Popăuți, by contrast, the foundations of the narthex form an enlarged plan. Buttresses were no longer constructed on the Northern and Southern façades; their role was taken over by an enlargement of the foundations along the axis corresponding to the arch separating the nave from the narthex, a new solution encountered in the churches of the period. The enlarged plan can also be found at the churches of “Precista” in Bacău (1491), Saint Nicholas in Dorohoi (1495), and “Precista” Monastery in Tazlău (1496).

A preliminary chronological analysis of the church foundations described above, together with the correlation of data collected from the buildings suggests that the depth of the foundation footings, measuring between 0,90 and 1,00 m, became characteristic of a certain historical period and a certain type of church and can therefore be used to date constructions. Consequently, we could hypothesize that churches with these characteristics belong to the period extending from the second half of the 14th century to the first half of the 15th century. Greater foundation depths, between 2,30 and 2,50 m, belong to another period, after 1450, when construction techniques diversified and larger stone-masonry buildings appeared. All these data confirm both an evolution of the architectural concept and, implicitly, an improvement in construction techniques. Church-building activity acquired a dynamic component, probably

also because the economic, political, and social climate of Moldavia was favourable to the market entrance of master builders who had gained experience on larger construction sites.

A study as complete as possible of the churches built between the middle of the 14th century and the middle of the 16th century cannot be undertaken without examining another aspect of church construction, namely ***the vaulting system***. We initiated this research starting from the following question: are the churches we study today identical to those built in the years mentioned in their original inscriptions? The answer is difficult to give, precisely because there are few documents that explicitly refer to possible alterations made to these buildings. What we nevertheless have at our disposal are the very structures of the churches examined in this study. But could a church structure, “speak” about its own history? Here is another question that leads us both to the documents, as many as there are, and to the statistical data available to us.

Borrowed from the architecture of the churches of Mount Athos, the vaulting system composed of vaults, arches, spherical triangles, domes, and cupolas represents, from the point of view of the craftsmen who built the church, a challenge and reflects the level of technical knowledge they possessed. The underside of the vaulting system defines the outline of the formwork over which the above-mentioned constituent elements were constructed. These techniques responded to the requirements of the person who commissioned and paid for the works. Previous experience on other construction sites provided the basis for new concepts in vaulting systems. Probably, before the 14th century, church buildings were erected starting from initially simple constructions. Gradually, as exchanges of information and construction techniques emerged, craftsmen executed more complicated works requested by patrons, voivodes or boyars at the princely courts. But this new type of construction imposed strict rules of execution intended to ensure the stability of the new building. Carpentry work in such cases was extremely difficult to execute, requiring a considerable body of knowledge concerning the geometry of forms.

Subsequent to the analysis of the studied churches, we observe that this method of covering the structure of a church evolved from a simpler system toward a more complex one.

The influences that determined the use of a particular vaulting concept can be found in the regions from which the patrons of the works came. In the churches built during the reign of Ștefan cel Mare, the vaulting system used over the nave was structured on three tiers. The first consisted of four principal arches, constructed as semicircular arches; the second of another four semicircular arches, rotated by 45 degrees around an imaginary vertical axis; and the third consisted of the cylinder of the tower, completed by a dome. The construction of this ensemble

required thorough knowledge of applied geometry and precise control of geometric forms (Balş, 1931, 66–70). The gist of the constructive solution chosen for creating a vaulting system over the main nave was based on brick vaults and arches. ***These architectural elements have their roots in ecclesiastical architecture in Armenia*** and are characteristic of the cruciform basilica with a dome. The dome based on a square inscribed within a cross was regarded as a symbol of Christianity: the three constituent elements — the cross, symbolizing the crucifixion of Christ; the square, symbolizing the earth; and the dome, symbolizing heaven — represented a form of emancipation of Armenian culture from Byzantine and Persian cultural influences (Grigorian, 1993, 328). This type of church, combined with the introduction of apses at the arms of the cross, was subsequently implemented in the architecture of Mount Athos (Curinschi-Vorona, 1997, 9). Probably through the catholicon of the Great Lavra Monastery, built by Athanasius, a monk originally from Trabzon (Trebizond), this architectural model was introduced to Mount Athos and subsequently adopted by most of the churches in the area (Balş, 1913, 14). It is possible that this type of church also entered the Moldavian area through the Serbian Athonite monks, who first reached Wallachia and Dobrogea.

These constructive solutions may have been applicable only to the construction of the nave and to the initial elements of the vaulting ensemble, namely the first four principal arches followed by the half-domes over the altar and the nave apses. ***The second stage, in which the diagonal arches, pendentives, and vault were constructed, was an original creation of the master builders who worked on these churches.*** Probably, at the explicit request of the ruler to have an architectural element entirely dedicated to the icon of Jesus Christ Blessing, as represented in the dome of the tower above the nave, the builders were forced to find a solution. The novelty of this system may have derived from the fact that a building can be made slenderer only when the used structural elements — in this case, the walls and main arches — could ensure safety for both the builders during construction process and the people who would use the interior spaces of the church. Simple masonry structures using stone or brick are fragile when raised to great heights. What the craftsmen had at their disposal was a structure consisting of walls of rough stone masonry, arches with relatively small spans, and pendentives. From our point of view, we consider that this entire vertically developed ensemble was an innovation of the period, a creation of the master builders.

This could only have been achieved through a constructive solution that raised the vaulting of the nave. Raising the masonry cylinder forming the tower above the nave was risky because the structure became unstable. What remained to be solved was only the raising of the tower base. This raising involved the vertical multiplication of the first tier of arches, a goal

achieved primarily by identifying support points for the second tier of arches, which was precisely the essence of the new vaulting solution. Due to their practical spirit, the master builders found these support points at the vault keystones, where the masonry of the arches was under tension, at points located on the extrados of the masonry of the main arches. Consequently, the positioning of these support points determined that the tier of arches should be rotated around an imaginary vertical axis, in the horizontal plane, by an angle of 45 degrees relative to the main arches. The four new arches had spans equal to 70% of those of the main arches and were called diagonal arches. The positioning of these points caused the new arches to have smaller spans and to define, in the horizontal plane, a square whose axes were rotated by 45 degrees relative to the plane of the main arches. The problem solved, the construction of the tower masonry followed as a consequence of this solution. The empty spaces between the two tiers of arches were covered by pendentives, a constructive solution already known to the craftsmen. Once the first tier of arches had been doubled, the execution of the masonry cylinder constituting the tower was carried out using already-known techniques. This was the second stage that we consider to have been the creation of the building craftsmen.

The transition from the plan formed by the four diagonal arches to a circular base above which the cylinder of the tower was to be constructed required, as in the transition from the plan defined by the four principal arches to that formed by the diagonal arches, the construction of four masonry elements that defined, in vertical projection, one spherical triangle for each formed corner. Thus, the actual construction of the tower could be carried out and, consequently, the vault could be built so that it could nest the painting the ruler desired. It thus became a technically original achievement and, at the same time, it completed the image of duality between heaven and earth represented by Jesus Christ and the ruler. Perhaps this also explains the fact that on the Western wall of the nave the votive painting depicts the voivode, together with his family, offering the church he had built to the Savior as a sign of homage. At the same time, the creation of this first volume of the church, which fulfilled both the requirements of the liturgical service and the presentation of the image of a ruler who had the support of the heavenly powers in the policies used to govern the state, was to become a model for all the churches built during the reign of Ștefan cel Mare.

The construction of such a system required, in addition to solid knowledge of geometry, a precise execution of the elements composing the system. Methods of measuring surfaces were not very precise at the time, which meant that, during the execution of the works, corrections had to be made to the positioning of the main arches. Whereas for the exterior walls, in constructing the elevations, the builders relied on “centring” them along longitudinal and

transverse axes, for the vaulting system matters were more complicated because the builders had to know the vertical axis and the vertical projection of the tower above the naos, as well as the positioning of the main arches. Depending on these factors, the dimensions of the arches that doubled the main arches could be calculated. These are the reasons why we consider that, from the very beginning of the construction project, the final form of the building and, implicitly, that of the vaulting system were already known to the builders. Thus, the setting-out works began with the positioning, laying out the longitudinal and transverse axes, and projecting vertically the main arches, the diagonal arches, and the tower above the nave. The crypt or the narthex could then also be positioned, and the construction of the exterior and interior walls of the church could proceed, taking into account the spaces intended for the altar, the nave apses, as well as for the crypt–narthex.

In the chronology of church building in Moldavia, the beginning of the 16th century was marked, by the appearance of another innovation in the vaulting system of the narthex section found in the churches dedicated to the “Beheading of Saint John the Baptist” at Arbore (1502) and the “Descent of the Holy Spirit” at Reuseni (1504). At Dobrovăț Monastery (1503–1504), dedicated to the “Beheading of Saint John the Baptist,” this new solution is found in the vaulting of the crypt. The innovation refers to the fact that the span required for a vault defined by the walls of a room can be reduced with the help of successive arches which, arranged in one direction or another, delimit a smaller surface to be covered by a vault.

If we analysed this new technique without taking into account the year of construction, we might believe that this ingenious system was used for the first time in the vaulting of the crypt of the church at Dobrovăț Monastery. Here we notice a certain lack of skill in execution, resembling an experiment. The vaulting of a room with a rectangular plan is achieved by means of two successive different span arches on each of the Northern, Southern, Eastern, and Western sides spans. The opening delimited by these arches is covered by a small vault, which contrasts in proportion with the widths of the arches. At the churches of Arbore and Reuseni, by contrast, we no longer encounter the same disproportion between the arches and the vault.

The problems highlighted above lead to ***the hypothesis that the churches built during the reign of Ștefan cel Mare may have had smaller layout dimensions and may have consisted only of an altar, nave, and crypt.*** It is difficult to accept the idea that church-building activity had slowed down during the reigns of Bogdan III (1504–1517) and Ștefăniță (1517–1527), when this very activity legitimized the voivode’s power and authority upon the people. ***In this context, we believe that, in addition to founding their own churches, such as the Church of Saint***

George of the Monastery of Saint John in Suceava, the voivodes enlarged the layouts of some other ecclesiastical buildings by attaching an exonarthex, retaining the crypt and allowing more people who were not members of the founders' families to enter the church, thereby giving rise to the narthex. In some cases, when necessary, the rulers repaired the churches built by Ștefan cel Mare.

During the same period, that may be considered the age of full authority of the great dignitaries at the Princely Court, during the reign of Ștefăniță Vodă, church construction continued. Such are the cases of the church dedicated to the “Forty Holy Martyrs of Sebaste” at Văleni-Neamț, built between March 30th 1519 and June 22nd 1519 by the great *postelnic* Cozma Șarpe; the church of the treasurer Ieremia at Brănișteni-Neamț (1520); and the church dedicated to “All Saints” at Părhăuți (1522), founded by Gavril Troțușanu, great logothete.

If the reign of Ștefan cel Mare has a distinctive mark due to the crystallization of a church-building concept that may be called *ștefanian*, the churches built during the reigns of Petru Rareș (1527–1538, 1541–1546) were more balanced from an architectural and constructive point of view. The working techniques used for the latter show the high qualification of the master builders, especially in stone working. The craftsmen paid greater attention to details. Compared with the churches built earlier, it can be observed that natural-stone elements such as columns, colonnettes, and corbels were used to embellish the interior. Other decorative elements, such as entrance portals and door and window surrounds, attest to influences coming from Western Europe, which fit within the architectural lines of Gothic architecture. In addition to the church layout, all these elements complete the overall image of a church building that is a synthesis of an architectural program of Byzantine tradition combined with masonry and natural-stone-working techniques of Gothic influence (Emandi, Ceașu, 1973, 181). During that period, ecclesiastical architecture reached its peak.

The enclosed exonarthexes of Probota Monastery and Saint Demetrius Church in Suceava mark another stage in the mastery of the builders and provide evidence of Western influences in the ecclesiastical architecture of 16th century Moldavia. Unlike the exonarthexes at the Humor and Moldovița Monasteries, where the openings on the sides of the porch were not enclosed, at Probota Monastery and Saint Demetrius Church in Suceava the patron chose to obturate them with glazed elements. Although the construction years differ, the techniques of enclosure are similar. In this context, however, the question arises: at which of these two churches were the openings first closed with glazed elements? One of the many questions that still await an answer.

After an imaginary journey to the construction sites of the Moldavian churches erected between the middle of the 14th century and the middle of the 16th century accompanied by a review of the associated archaeological sites, we can perceive the outline of a series of medieval constructions where time stood still. At the same time, we sense the presence of the people who built them, experienced failures, then experimented with various construction techniques and materials, made inventions, and adjustments to events that influenced the churches they built. These people are none other than the *makers of history*.

When we look upon a church built during that period, we tend to judge it according to the nowadays realities. But this is not right. The image of today is composed of a sum of historical events, of the experiences and life histories of the patrons and of those who were the master builders. The latter expressed themselves through the constructive forms they created or borrowed from other craftsmen of their time, who migrated from Western construction sites in search of work contracts and remuneration. Probably, more than once, the experience acquired on larger construction sites solved technical problems that arose on the construction sites of Moldavian churches. ***The miracles that these churches are today represent, in fact, a “crystallization” of historical moments in which the silhouettes of those who actually participated in the construction of these edifices remained immobile within the identity of what we nowadays call a historic monument.*** They are revealed by both archaeological research and written sources, as well as by modern methods of investigation.

Therefore, from our point of view, we consider both the architectural value of a historic monument and its history to be equally important. It is the historian who introduces the architect into the universe of a monument, presenting the profile of the people who participated in the construction of the building, the social and economic environment in which they lived, the working techniques and construction materials used, as well as the stages of construction dictated by events occurring throughout the history of the building. The result is precisely the identification of the original historical substance. We pursued these objectives throughout our research, wishing that the information gathered both in the field and from archives would become documentary material for those who will protect, consolidate, and restore the historic monuments presented in this work. Last but not least, we attempted to highlight the activity of the *builder*, whether voivode, boyar, or craftsman, who is, more often than not, forgotten in the work of those active in the field, because, in our opinion, the protection and restoration of historic monuments ultimately represent ***a profession of faith to the work of these people.***