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THE THEORY AND HISTORY OF ARCHITECTURE

Mykola Bevz

**PAINTING DECORATIONS ON THE OUTSIDE WALLS
OF THE CASTLES IN POMORIANY AND IN YAZLIVETS**

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Abstract. The article describes the newfound fragments of polychrome paintings in the upper tiers of southeastern castle tower in Pomoriany. The paintings are found on the outside wall of the tower. The polychrome murals are preserved in fragments. The paintings decorated the plastered walls of the at the top two levels of the tower and can be dated roughly to the 17th century. Another mural fragment, discovered on the outside of the north wall of the castle in Yazlivets, is much smaller, but richer with colors. Such exterior castle walls decorating with polychrome paintings are rare in Ukraine. It is proposed to preserve and conserve these fragments of murals.

Key words: castle, painting murals, town of Pomoriany, town of Yazlivets, the 17th century.

Introduction

Painting mural at the exterior walls of castle buildings is a rare occurrence. The defensive function of the outside castle walls with holes cut for firing the enemy required walls to be strong and reliably thick, not decorated or painted. It became popular in recent times only, when castles lost their defensive value and turned into palace objects. We can find paintings usually from the courtyard, where they were used to create heraldic hand-drawn compositions. Therefore, the detection of fragments of such decorative murals on the outer walls of the castle is an extraordinary event and requires detailed illumination and further thorough study.

Purpose of the article: to present general data on the discovered remains of paintings, to analyze their parameters and to perform a hypothetical reconstruction of their original state.

Presentation of the research material

The castle in Pomoryany was built in the 15th century. At that time, he belonged to the Russian family of the Kerdey, in particular, in 1462 voivode of Podillia Hrytsko Kerdeyovych was the owner. Later it belonged to his son Sigismund Kerdey, chief of the Terebovlya, who died in 1498 defending the castle from the Tatar attack (wikipedia, 2019). Some preserved stone-built wall fragments can be dated to the 15th century. Although most researchers submit a later date of foundation of the stone castle, considering that it originated in the XVI century. (Logvy`n, G. N., Godovanyuk E. M., Kravec`z Y`. M., Mo`gytych Y`. R., Tregubova T. A., 1985). The castle is built on a low hill among the former swampy valley of the Zolota Lypa river and its

tributary Makhnivka. Water surrounded the castle on three sides. Only from the side of the city, it was possible to reach the castle by land. According to our hypothesis, the original castle was built in a square form with an inner courtyard and four corner towers. On the north side of the town, the castle was separated by a moat through which a bridge was constructed.

From publications and historical documents, the following chronology of the castle owners change is traced: the middle and the end of the XV century – the castle belongs to the families of Kerdey and Kerdeyovych; in the 1490s, nobleman Mykola Svyuka is mentioned as an owner of a village and a castle (wikipedia, 2019); there is also a mention that at the end of the XV century the castle was owned by Zygmunt Senensky of Olesnytsia (apparently due to his marriage to Jan Svyuka's daughter Anna) (Vechersky, 2011); at the beginning of the XVI century the owner was the Lviv casteman Jan Senensky (Vechersky, 2011); castle was in the hands of the Senensky family during the whole XVI century; from 1619 the castle belonged to the Sobieski family; in 1740 the castle was bought by Myhailo Radzywill (Vechersky, 2011); at the end of the XVIII century the castle became the property of the Pruszynski family; in 1879 the building was purchased by Stanislav Pototski; the castle belonged to this family until 1939 (Vechersky, 2011); in Soviet times the preserved two-storeyed north and west wings of the castle were used as an educational institution. In recent years, the castle is in ruins.

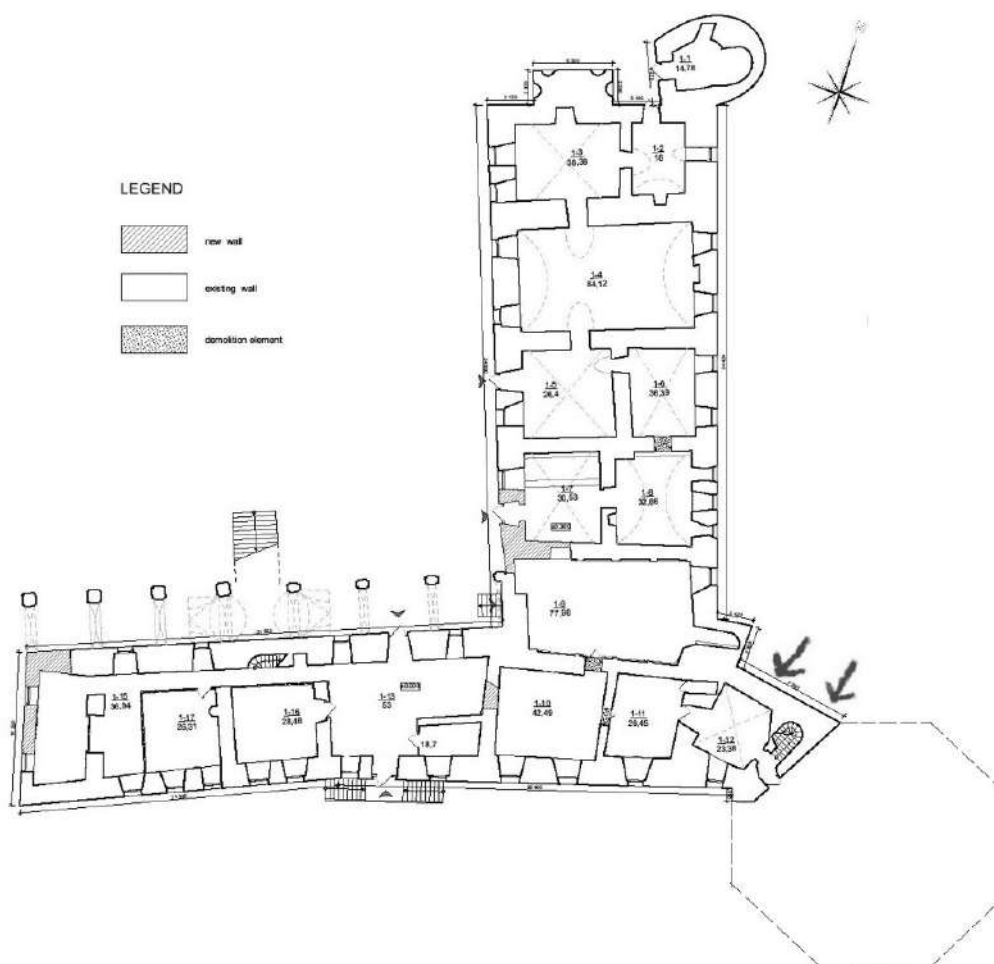


Fig. 1. Plan of the castle in Pomoryany as of 2017. Drawing – by Kalyna Havryliv.
The arrow indicates the location of the painted wall

Unfortunately, the architectural history of the castle has not yet been fully explored. Previous publications have paid attention to the change of owners and in very general terms described the restructuring of the object. The architectural biography of the castle and the dates of its remodelling remain unknown. The preserved two wings of the castle were created at different times so that they should be carefully examined and

dated. It is unclear when a set of four soil bastions was built around the castle. When was the first park laid? On the walls of the castle are visible traces of bricked-up windows and traces left from annexes, which need to be thoroughly inventoried and identified. The first steps in the identification of the castle building were made several years ago during the completion of the diploma project on the restoration and adaptation of the castle (author of the thesis – A. Vihasty, academic advisor – assoc. prof. O. Rybchybsky, the Department of Restoration of Architectural and Art Heritage (RAAH) at Lviv Polytechnic National University). However, this work is still unpublished.

The preserved ruin presents features of Renaissance architecture with a tall frieze in arcade-style. A careful analysis of the preserved walls shows that these renaissance building forms are not the oldest. They create a newer substance based on older walls, which were built of pieces of stone and had firing ranges in the form of a key for hand-held firearms. We hypothesize that the attic completion of the tower is newer and imposed on older walls (see Fig. 4). An in-depth study of the history of the Pomoryany castle by Alexander Cholovsky contains a very valuable plan for the castle complex of the 18th century. On the plan, the tower has a layout scheme in the form of a five-angled defence building, reminding the typical scheme of the “punte” tower. Comparison of the tower plan in A. Cholovsky’s documentation (Fig. 2) with the modern plan (Fig. 3) indicates that the three outer walls of the tower were not preserved. Two walls (north and east) were completely lost, and a small fragment remained from the third one. The foundations of the former pentagonal tower have been preserved in the ground and can still be identified today by the topography of the relief.



Fig. 2. Drawings of the fortifications of the Pomoryany castle taken from the work of Alexander Cholovsky.

In the northeast corner, a round tower with facets is marked. The western wall we are exploring is a preserved part of the “neck” to this tower. This wall is marked by an arrow

We found the murals in October 2016 during the inventory and photo-fixing work at the castle within the framework of the master’s thesis work of the student Kalyna Havryliv. During the joint exit to the object, the upper layers of the plaster were observed to disappear in many places on the walls of the castle. From under the plaster, we were able to see, in particular, bricked windows with Renaissance carved rosettes on the second tier (in the gallery) were opened.

The paintings were at the height of the second and third tiers on the outer wall of the southeast corner tower (Fig. 1). This tower has been preserved in its reconstructed form. Its northern wall is best preserved and features Renaissance style with the remains of a “blind” arch belt over which, apparently, once had an attic end (sketch at Fig. 2). Nowadays the upper part of the tower has a cornice end that is dated to the time of the rebuilding of the castle under Jan III Sobieski. The bricks and the eaves are similar to those parts of the castle

that are identified with the times of reconstructing of the castle to the royal palace. The lower part of the tower is made of broken limestone. This is probably the oldest substance. Therefore, the investigated wall of the tower, according to our hypothesis, has three elements that differ in time of construction. Polychrome paintings adorned the second and third tiers of the facade.

Red, grey and blue colours dominate in the paintings. The murals are in the state of an emergency. Most of them are lost, although preserved fragments can be used to reconstruct an integral image. The second tier of the tower was painted with rosettes almost two meters in size (Fig. 2), among which were drawn some geometric figures (Fig. 3).

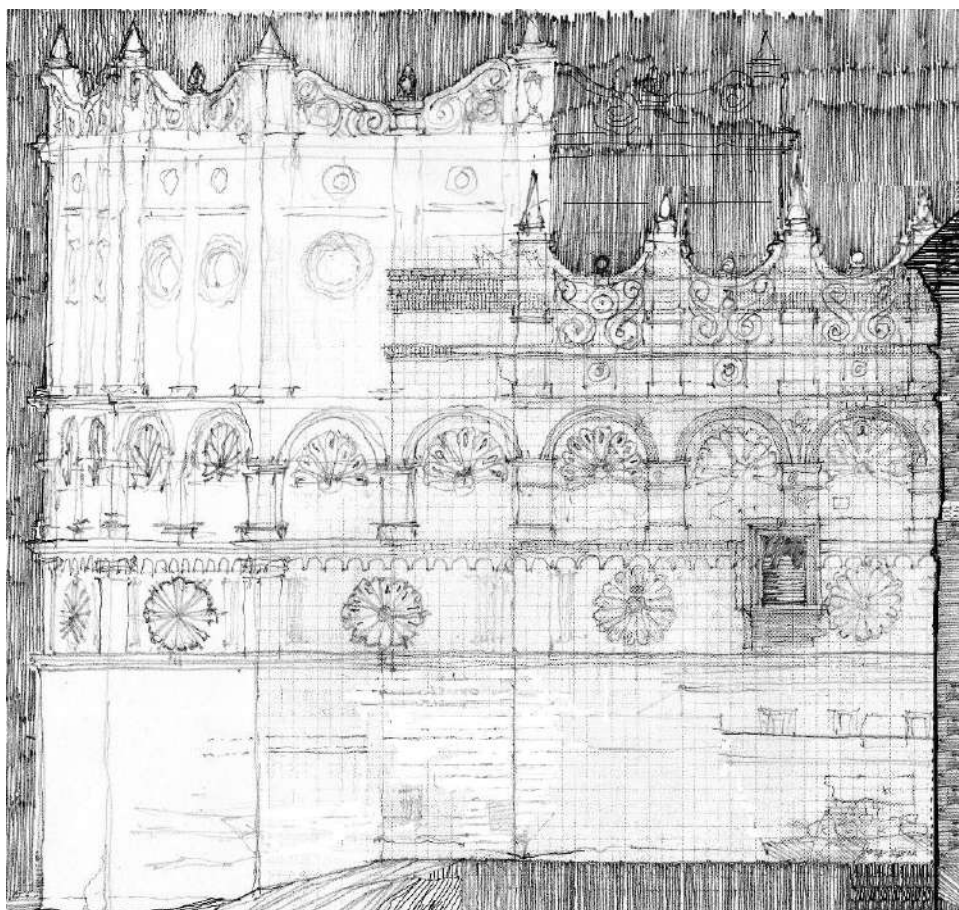


Fig. 3. Hypothetical reconstruction of the lost octagonal Renaissance castle tower with polychrome pattern. Drawing by M.Bevz, 2017

An arch belt was painted above the large rosettes below the cornice. It could still be explored in more detail since only its small fragments can be seen from beneath the preserved upper layers of the plaster. The rest is hidden under the newer layer of plaster (Fig. 2). By carefully removing this plaster, we can see the whole decoration scenery.

The third tier of the tower, which was built with a blind arcade, was also decorated with polychrome paintings. Their pattern corresponded to the arcade profiling of the wall. Under the arches were painted half-rosettes similar in style to those found on the 2nd tier (Fig. 4). The pilasters had hand-drawn fluting. Their traces are still barely readable. Above the arches, striped archivolts (at 7 belts) were drawn in detail. The triangular fields between arches above the pilasters are the most interesting: there is a large rose with symmetric branches. 30

In the winter of 2018, due to unfortunate restoration work, the entire southern wing of the palace and the southern wall of the northern part collapsed. The western wall of the northeast tower we are exploring is completely ruined but has not yet collapsed. The photo fixation of the paintings we did September 2019 shows

the slow degradation of the paintings due to the rains washing and the disappearance of the outer layer of the plaster that protected them.



Fig. 4. The north wall of the corner tower of the Pomoryany castle.
The places where the polychrome paintings preserved are indicated with arrows

The tradition of exterior murals on the walls of the Pomoryany castle has proven to be very enduring. An interesting fact is finding photographs from the early twentieth century which depicts a dummy painted window on the second tier of the same tower but on its north wall (Fig. 6). This is undoubtedly a later painting decoration. It comes from the time when the tower was already partially dismantled and plastered again. On the newly built part of the tower, a fake window was painted to give a symmetrical composition to the facade. It happened, probably at the end of XVIII – early XIX century. Similar drawings of dummy architectural decorations and elements are known from other objects. Large dummy framed windows were painted on the walls of the second tier. They decorated the lost gallery with a colonnade of Zhovkva Castle after its rebuilding in the 18th century. We were able to fix the polychromy of these windows in the late 1990s (Fig. 7). Nowadays these murals are already completely lost. Similar painted window decor is on the walls of Pidhirtsi Castle at the junction of the second tier with the terrace on the south side of the palace (Fig. 8). In our opinion, these paintings should also be dated to the eighteenth century.

Very small remains of external paintings we discovered on the northern walls of the castle in Yazlivets, Ternopil region. Yazlivets castle has a more researched architectural history (Chiebowski B., Walewski W., 1887) than the one in Pomoryany. An outline of his history was covered by Alexander Cholovsky (Czołowski, 1892), and in the interwar period, the castle was thoroughly surveyed and archaeologically investigated. At the same time, its measurements were carried out by a group led by Bogdan Gwerken (Queguin, 1960). However, none of the researchers paid attention to the preserved small fragments of polychromy on the north outer wall of the castle. Fragments of the paintings were discovered and recorded by us in 2011 thanks to the attention of architect-restorer Volodymyr Bevz.

Unlike the Pomoryany castle, fragments of paintings are in the lower tier on the straight section of the northern defensive wall between the semicircular tower and the corner (Fig. 6).

Unfortunately, only small fragments of polychrome survived, so it is unlikely to reconstruct the decoration. However, all fragments of the preserved plastering of the castle are worth examining in detail to determine the remains of polychrome. The preserved fragment shows a geometric pattern (Fig. 7) in several colours (red, grey, blue, white and ochre). It looks like it was an orthogonal grid of colourful lines that was combined with some other elements of the plant or figurative nature.



Fig. 5. A large rosette drawn on the 2nd tier of the outer wall of the corner tower of the Pomoryany castle

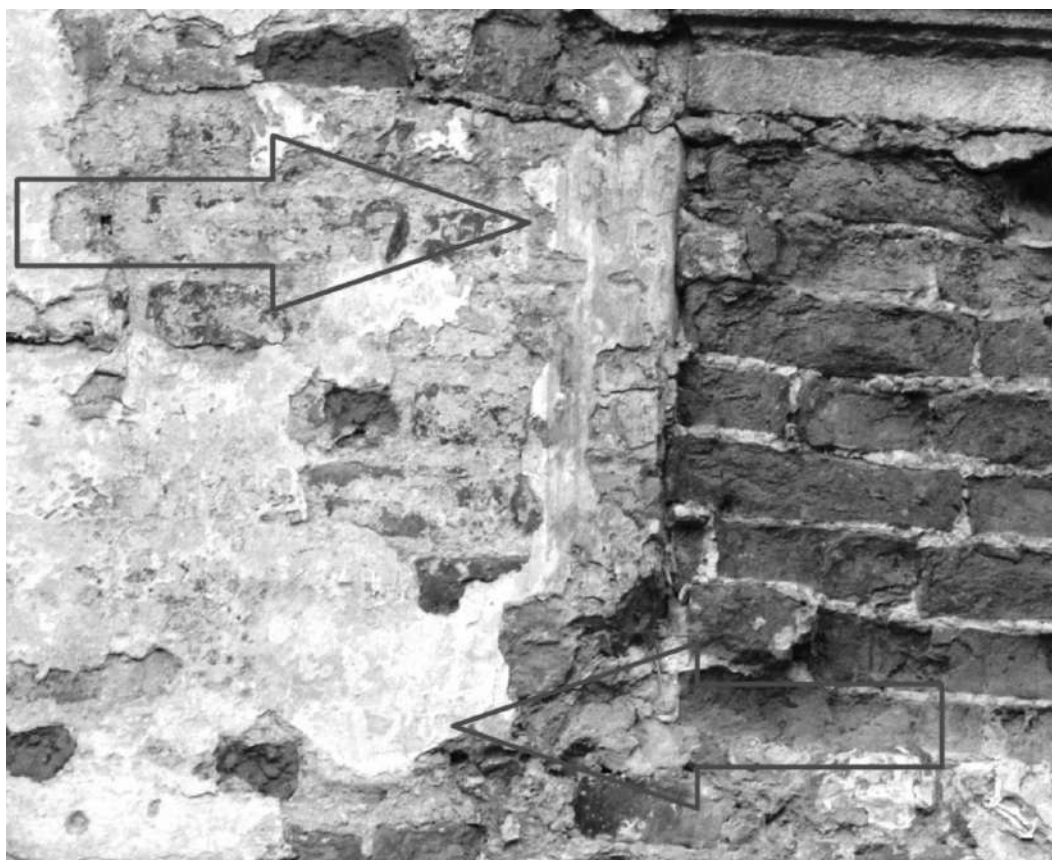


Fig. 6. Vertical hand-drawn painting (arrow 1) near the old bricked-up window opening on the 2nd tier of the outer wall of the Pomoryany castle corner tower. On the left side to the painting remained very small fragments of some other painting (arrow 2)



Fig. 7. Hand-drawn archivolts and half-rosettes in the arch belt on the 3rd tier of the outer wall of the tower. On the left side to the arch are fragments of a rose with branches



Fig. 8. Hand-drawn rose with branches on the 3rd tier of the outer wall of the tower



Fig. 9. The castle in Pomoryany. Photo from 1914. The place of the lost octagonal tower

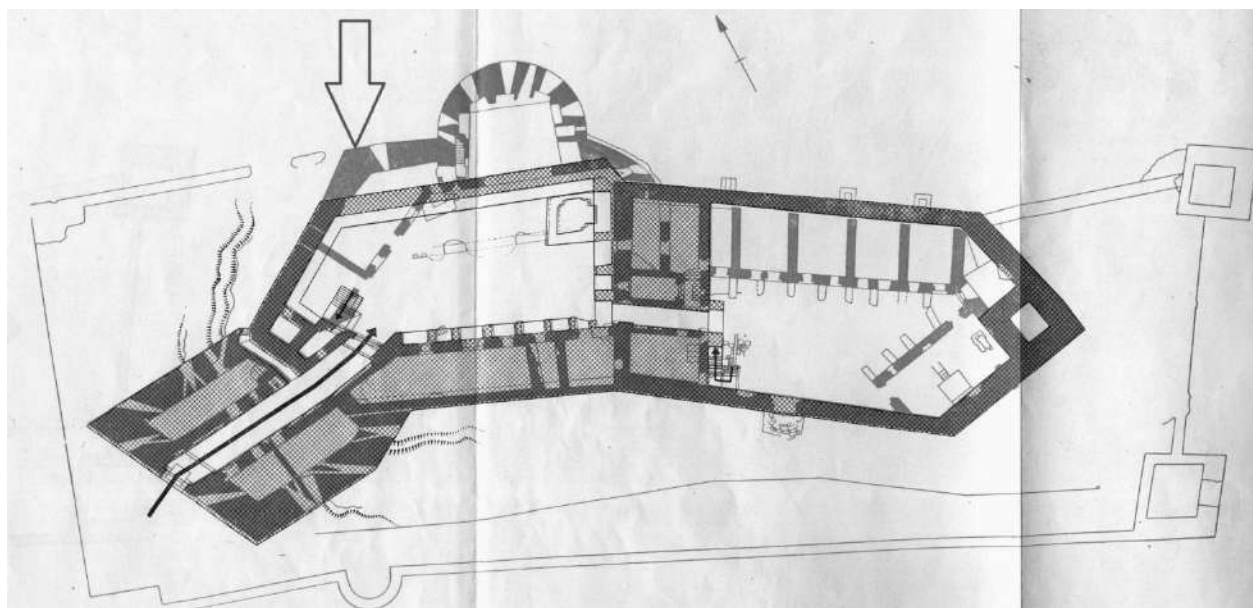


Fig. 10. Location of the found fragment of polychrome painting at the plan of Yazlivets castle (the plan is taken from the publication of B. Gwerken (Queguin, 1960), p. 113)

Conclusions

The results of our pilot studies on polychrome paintings in two castles show very interesting ways of decorating the castle facades. Based on a visual assessment of the stone substance of castles, we date these

paintings to the seventeenth century. The paintings found should be very carefully inventoried and examined, including laboratory tests. Small fragments of polychrome paintings on the two castles were fixed at the last moment. If no rescue work is carried out, these fragments will disappear in two to three years. Based on our discoveries, we can suggest that a similar way of decoration could be found at other Western Ukrainian castles.



Fig. 11. Fragments of paintings at the outer wall of the castle in Yazlivets.

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ЗНАХІДКА ЖИВОПИСНИХ ЗОБРАЖЕНЬ НА ЗОВНІШНІХ СТІНАХ ПАЛАЦІВ У ПОМОРЯНАХ ТА ЯЗЛІВЦІ

Анотація: У статті описано нововіднайдені фрагменти поліхромних розписів на верхніх ярусах південно-східної бапти замку в Поморянах. Розписи виявлено на зовнішній стіні бапти. Поліхромні розписи збережені фрагментарно. Вони творили малярську декорацію тинькованих стін замку у двох верхніх рівнях бапти. Датувати розписи можна орієнтовно XVII ст. Віднайдений фрагмент розпису на зовнішній північній стіні замку в Язлівці значно скромніший за розмірами, але багатіший кольористично. Декорування зовнішніх стін замків поліхромними розписами є рідкістю в Україні. Запропоновано врятувати та законсервувати віднайдені фрагменти розписів.

Ключові слова: замок, малярські настінні розписи, місто Поморяни, місто Язлівець, XVII ст.

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THEORETICAL AND TERMINOLOGICAL BASES FOR DEFINITION OF NEO-MODERNIST ARCHITECTURE IN LVIV

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Abstract. The article considers a problem of terminological determination of architectural objects of neo-modernism on the example of Lviv architecture, social and cultural preconditions and factors that influenced the formation of the neo-modern language at the turn of the XX–XXI centuries.

Key words: neo-modernism, late modernism, liquid modernism, Lviv architecture.

Introduction

The various phases of the modernization process, which continues from the eighteenth century, have also become a source of architectural development, which has undergone several stages of modernization. After conceptualization period at the turn of the nineteenth and twentieth centuries, now it is possible to distinguish two phases of the theoretically well-developed directions – “modernism” and “postmodernity”. However, after modernization resources of both were exhausted, new design techniques, that received different terminological definitions, began to gain popularity. Since in all cases it is a set of the same techniques, we can speak of the problem of defining a single optimal term that can outline the architecture in current phase of modernization.

Architecture development associated with the processes of modernization has already passed several fundamental phases, which in general, are confined to the concepts of “modernism” and “postmodern”. However, at the end of the twentieth century, some objects, which could not be attributed to either (the first or the second category) began to gain popularity. Consider the critique of the “high modernism” architectural design and disadvantages of “postmodern”, buildings of this nature have their own concept of shape. Due to historical circumstances of architecture in Lviv, all phases of modernization seemed to oscillate between extremes – modernism in the form of Soviet typical or neo-constructivist design and postmodern demodernization. During the 2010-s, there was a rapid transition to a new interpretation of avant-garde principles in design and arose a new architectural language that needed its own study and determination.

Results and Discussion

Diversity and dynamism that became main characteristic of architecture on the turn of XX–XXI centuries, greatly enriched the spatial environment of cities, but on the other hand – caused a reflection crisis about the objects created during this period in terms of architectural theory. Spatial solutions and ideology of new projects could not fully fit into either the well-developed theoretical framework of postmodernism or the previous

system of modernism with which they had much in common. Early postmodern ideologues such as Robert Venturi and Charles Jenks, in their descriptions of modernism, grounded on that fact that styles and ideologies evolved linearly, changing one another. In this sense, postmodernism was seen as the end of modernism, and transition to a certain universal state of synthesis and hybridization, within which the role of architecture as “communication” changes its role as “function”. Since “communication” in a free society has a high degree of freedom, postmodernism claimed itself a “final” status as a space of endless intellectual play, without the necessary ideological and formal frameworks. At the same time, early theorists of postmodernism too attached it to the rehabilitation of pre-modern images, which became the main pillars of the “communicative” mission of architecture. On the other hand, the criticism and denial of modernism has become a necessary attribute of postmodern discourse, taking on the form of ideological dogma, which contradicted the declared essence of postmodernity as a de-ideologized creativity. It is worth noting, however, that within the self-awareness of the early postmodernist, he contradicted modernism, not as an equivalent doctrine, but as a return to the “communicative” role of architecture as a “language” eliminated previously by modernism. In this sense, “silent” modernism was not forbidden, but simply disappears, being filled with “language” of the postmodern. In this regard, continued existence of modernist architecture in the early postmodern period, was seen by the latter as a kind of residual phenomenon, from which become its designation as “Late modernism”. The concept of “Late modernism” was introduced by Charles Jenks – one of the leading theorists of the early postmodern, who dedicated to it a separate book (Jenks, 1980). However, Jenks has already noted that “late modernism” is not a simple inertial phenomenon, but one of the attempts to answer the problems of modernism. In the 1970-s became known the projects of the so-called *New York 5 Group* (Hays, 1988), in which the modernist form was used not only to provide the most rational function, but also as a means of constructing a pathos. Unlike postmodern objects, in which sources of “language” and “communicativeness” acted via historical architecture motifs, some members of the New York group began to use abstract geometric forms as a means of “communicativeness”. In this sense, they returned to the origins of abstract art, such as the work of the *De Stijl* group (Denker, 1982). As a result, abstractionist aesthetics were released once again from attachment to function and became a self-contained artistic language, as it was at the beginning of the age of abstract art, which makes the term “late modernism” no longer appropriate. Rather, it is possible to speak of the revival of “pre-functional” modernism, linked to the original theory of avant-garde “art for the sake of art” (Edwards, 2006).

During the 1980–90s, it became clear that the predictions of postmodern theorists about the gradual disappearance of modernism were not come true. Modernist architectural language continued to exist, gradually moving away from the features that were the subject of criticism in the late 1960s. In 2000, sociologist Sigmund Bauman proposed the use of the term “liquid modernism” (Bauman, 2000). Bauman saw “liquid modernism” as a chaotic continuation of modernism, characterized by a sense of insecurity, the variability of social roles and positions. The situation of “liquid modernity” requires the person to take responsibility for his choice, contribution to social life and development (Bauman, 2000). The leading categories are temporality instead of permanence, variability instead of static. The predetermined being order, becomes the object of self “existential” construction by the individuals (Phillips, 1994). Around the same time, also appears a concept of “reflexive modernism”, which was proposed by Anthony Giddens, Ulrich Beck, and Scott Lesh (Beck, U., Giddens A., Lash S., 1994). In their understanding, the “reflexivity” of modernism comes when “high” modernism achieves all its objectives, derived from such features as universal education, the welfare state, civil and universal political rights. When completed, these progressive qualities become objects of mutation and rethinking (Chanqi, 2012). The traditional nation-state, family, religiosity dissolve under the pressure of two forces – individualization and globalization (Larry, 2007).

Another notional framework of modernist architecture, which continued to exist despite the criticism by postmodernists, is the concept of “neo-modernism”. The neo-modernist ideology based on preservation of the rationalistic priorities and abstract symbolism (Szyjkowska-Piotrowska, 2016), which, however, are combined with irrationality, spontaneity and limited expressiveness. Unlike modernism, neo-modernism recognizes the value of personality and individuality, without considering it merely as part of an abstract system. At the same time, neo-modernism undermines postmodern perceptions of the relativity of all values and tends to systematize them on an

appraisal principle. In this regard, although neo-modernism recognizes the informational singularity and the inability to reach for person, or even a certain collectives all knowledge, he nevertheless tends to create such content that takes the form as a “last word” (Correia, 2011).

In the context of modernization theory, the changes that are considered is about transition phase from so-called Third Industrial Revolution (1947–1970) to the Fourth (1970 – probably 2020). The latter characterized by informatization, by networking and a knowledge-based economy (Research Group for China Modernization Strategies, 2006). In this sense, it is worth noting the mutual correspondence of the modernization phases theory and the early postmodern theorists interpretations, who were contemporaries of the transition of the industrial phase to the information phase. If during the period 1947–1970 there was a process of automation of (already industrialized) production, one can understand the perception of abstract aesthetics of “high modernism” as a value, and its depreciation in the early stages of the network “communicative” society, which began to perceive architecture as not a “function” but as a “language”. However, in this case, neo-modernism no longer acts as an inertial remnant of a phenomenon that belongs to the past, but simply as an architectural expression of a more recent stage of modernization. In other words, it can be said that the predictions of early postmodern theorists the end of modernism, in fact, was only its transformation, and postmodern itself, a short period of “reaction”, or in general the most archaic form of communicative architecture, the development of which continued to take place in modernism strata.

A separate aspect of modernist design terminology of the XX–XXI centuris boundary, is that they consider issues existing in a broad socio – cultural context. Neo-modernism, in this case, is perceived as a material expression of the broader phenomenon of changing relationships and political changing in society and its orientation. Avant-garde in architecture, traditionally associated with liberal and socially-oriented public inquiry (the most striking example of which can be the work of Robert van Hoff) (Vermeulen, 1986). “Classical” architecture, on the contrary, has often become a way of materialization of totalitarian and hierarchical systems. In this sense, however, it is difficult to relate the revival of hierarchy and traditionalism whith the revival of traditionalist morphology in the postmodern era. The “Student revolution” of 1968, one of the important links in the birth of postmodern, on the contrary, emphasized the inadmissibility of any violence, advocated the full freedom of choice and respect for the individual (Croker, R., Dychtwald, K, 2007). Therefore, the postmodern wave of traditionalist morphology should be linked rather to the shifting of modernism from the “obligatory” category to the free choice category.

In Lviv`s architecture, the sequence of “modernism” – “postmodern” – “neomodernism” had a pronounced character due to the underlined sharpening of the features inherent in each of these tendencies. As the consideration of the modern stratum goes beyond the thematic limits of this article, it is only necessary to note that it presented mainly by extremely pragmatic examples of typical Soviet architecture and a number of representative objects made by modernist manner individual projects in a, sometimes with neo-constructivism elements. Soviet construction of the 1980s–90s was a kind of extreme rationalism, which became especially vulnerable to growing postmodernists criticism (who in the Soviet and post-Soviet space were more latent than open-minded). During the 1990s, in the wake of this criticism, a period of radical demodernization of architecture begun. That is way such architecture where associated with the particular “seriousness” of the postmodern stage in the history of Lviv (and generally post-Soviet) architecture - the lack of irony, game of meanings, easies, theatricality (Mizrakhi M., 2010). Very often projects looked like a stylization of industrial materials and construction under certain patterns of traditionalist culture of feudal historical periods. Not literally reproducing the proportions and decorative techniques of pre-modern styles, the design solutions used specific “demodernization” elements – towers, arches, sloping roofs, rust and more. This wave of “demodernization” was a natural reaction to the pseudo-modernization experience of the socialist countries, in which the development of industry and universal education was not accompanied by the expansion of the civil and political rights of society. Thus, the attention and expectation of greater freedom, both in the Western and post-socialist world, was re-focused on the past, but if in the first case it was only to unburden the framework of modernism itself, then in the second – a full-fledged belief in the utopia of the past, as a more perfect and effective system of social relationships. The low number of new construction in Lviv during the 1990s and

2000s, however, did not allow this demodernization trend to develop in full extent. This time, single residential, banking and sacral objects were created, some houses into historic aeries. A wave of neo-modern architecture associated with the mass-construction revival of in Lviv during the 2010s. Objects that can be classified as neo-modernistic are characterized by a return to the original principles of avant-garde art, without being bound by the formula “form follows function”. Research of project practice specifics in Lviv suggests that the change in the architectural paradigm was due to two major factors. Firstly, these are the requirements of an increasingly competitive real estate market, in the context of which there was a need for the “legalization” of residential buildings, which became appropriated with attractive names and spatial images. Secondly, the acquaintanceship of local architects to the neo-modern architecture of Western Europe, which has already passed the postmodern stage and developed the language of a new, more liberated modernism, played an important role.

There are two main types of neo-modern objects, that emerged in Lviv architecture during this period. The first, is characterized by a clear rectangular geometry, in which the architectural image is formed by a series of irregular compositional nuances. With their help is possible to avoid the predictability and monotony effect inherent from “heroic modernism” and create a richer three-dimensional environment (Fig. 1). This type of neo-modern architecture is also (to some extent), approximated to the constructivist design method, which was characterized by the design of certain functional elements, to enhance the architectural image of the structure. Thus, the effect of compliance with the principle of “shape follows function” is achieved, but the possibilities of shaping are greatly expanded. In Ukrainian architecture of the Independence period, this way of design first became widespread in the construction practice of Dnipropetrovsk in the 2000s. This kind of architectural solution, although they mostly lack outstanding artistic qualities, and do not serve the accents that dominate the space, nevertheless, create a rich background environment and depart significantly from the inertia of the typical and normative design of the Soviet era, which was still preserved in Lviv architecture of the postmodern period.



Fig. 1. Apartment buildings on the UPA Heroes street and Chornovil Avenue (design of “AVR Development”)



Fig. 2. Apartment buildings on Lypynskoho and Kulparkivska streets (design by Igor Gryzliuk)

Second type of Lviv neo-modern objects are dynamic compositions in which the purpose of creating a charismatic image is somewhat outweighed a logic of purely functional morphology. It should be said, that here, in greater extent, is seen attempts to interpret the architectural form as “language”, as postmodernists did in the past, but unlike the latter, this “language” creates by means of avant-garde visual culture, without naturalistic and classical order quotations. The architecture of such structures represent a spatial way of constructing pathos, the main means of which are: large scale, contrasting color and plastic mass (Fig. 2).

Due to the rapid development of neo-modernism in Lviv architecture (which has no analogues in other cities of the Western region of Ukraine), one should pay attention to the worldview aspects of this phenomenon. It's been said before that the sequence of “modernism” – “postmodern” – “neo-modernism” is a chain of constant modernization, which moves in the direction of constant liberation from various kinds of restrictions from ideological to technological. At the stage of neo-modernism, we can note:

- 1) Tendency to be exempt from the influence of political and cultural institutions;
- 2) Critics of liberalism as a kind of new “compulsory” ideological system of views.

Although liberalism was imagined as an area of ultimate freedom, it also appeared to have limitations. Argentine political researcher Carlos Escude describes the content of these borders. He writes that humanity must resolve the dilemma - if all cultures are morally equal, then all human individuals do not have equal rights, because some cultures, for example, give men more rights than women. If, on the other hand, men and women are endowed with the same human rights, then all cultures are not morally equal, because cultures that recognize that “all people are created equal” should be considered “higher”, more developed than those who don't think so (Escude C. 2006).

The era of neo-modernism, in this context, tends more clearly articulate its own self-sufficiency and absoluteness, that's why it partly, return to the ideology of “heroic” modernism. For the specifics of Lviv (as well as the post-Soviet context in general), an important sign was the partial abandonment of the *utopia of the past*, and returning to a positive perception of the *present* and *future*. In this regard, postmodern aesthetics, which has here a signs of demodernization, was largely marginalized and pushed off from the mainstream. Neo-modern objects began to emerge, even in the historical environment, harmonization of which with the surrounding context carried out through the techniques of abstract art and not historical mimicry. Considering the specific socio-cultural phenomena that contributed to the development of neo-modern discourse in Lviv, we can note the following processes. In the context of protest against traditional cultural and political establishment, it is possible to note the important place that the city played in the mass protest during the Euromaidan in 2013–14, the developed network of civil society organizations, the absence of dominant influence of major oligarchic actors in the region and so on. Regarding to neo-modern rethinking of liberalism, throughout the period 1990–2010, city was a symbiosis of liberal domestic culture

(tolerant attitude to ethnic and linguistic minorities, heterogeneous cultural heritage, etc.) and traditionalist models of collective behavior (mass religious processions, regional ethnographic customs, etc.). In this sense, we can state that both trends manifested themselves in Lviv with particular intensity, why the surge in neo-modern architecture does not seem casual here.

Conclusions

– Within the modernization process, were formed several terminological definitions of the period and architecture on the turn of the XX–XXI centuries. In particular, “late modernism”, “current modernism”, “neo-modernism”. Each of them based on their own understanding of design ideological principles development and meaning of architectural form for society. Despite attempts to substantiate each of this definitions by a significant number of cultural and scientific studies as well as practical arguments, not all of them equally convey the content of the architectural phenomenon of a new interpretation of modernist morphology. The most adequate definition can be considered a term “neo-modernism”.

– Neo-modernism in the broader context can be attributed to: a) a tendency to release itself from the influence of political and cultural institutions, and b) moderate criticism of liberalism, as a kind of new “compulsory” ideological system of views. In the Lviv context, in the first case, it is worth noting the important place that the city played in the popular speeches during the Euromaidan in 2013–14, the developed network of civil society organizations, the absence in the region of the dominant influence of major oligarchic actors, etc. In the second case, throughout the period of 1990–2010, city was a symbiosis of liberal domestic culture (tolerance of ethnic and linguistic minorities, heterogeneous cultural heritage, etc.) and traditionalist models of collective behavior (mass religious processions, regional ethnography, etc).

– There are two main types of neo-modern objects, that emerged in Lviv architecture during this period. The first of them is characterized by a clear rectangular geometry, in which the architectural image is formed by a series of irregular compositional nuances. Second type of Lviv neo-modern objects are dynamic compositions in which the purpose of creating a charismatic image is somewhat outweighed a logic of purely functional morphology. It can be said that, that such kind of attempts have been made to interpret the architectural form as “language”, as postmodernists did in the past, but unlike the latter, this “language” is created by means of avant-garde visual culture, without naturalistic and classical order quotations. The architecture of such structures is a peculiar spatial way of constructing pathos, the main means of which are: large scale, contrasting color and plastic mass.

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Франків Роман

ТЕОРЕТИЧНІ І ТЕРМІНОЛОГІЧНІ ОСНОВИ ВИЗНАЧЕННЯ НЕОМОДЕРНІСТСЬКОЇ АРХІТЕКТУРИ У ЛЬВОВІ

Анотація. *Різні фази процесу модернізації, котрий триває від XVIII століття, стали також джерелом архітектурного розвитку, що пройшов кілька стадій осучаснення. Після періоду концептуалізації на межі XIX–XX століть можна виділити дві фази теоретично добре розроблених напрямки “модернізму” та “постмодерну”. Однак після вичерпання обидвома напрямками свого модернізаційного ресурсу, стали набирати популярності проектні прийоми, які отримали різну термінологічну детермінацію. Оскільки у всіх випадках ідеться про набір одних і тих самих прийомів, можна говорити про існування проблеми окреслення єдиного оптимального терміну, яким можна окреслити архітектуру на сучасній фазі модернізації. Врахувавши критику архітектурного формотворення періоду “високого модернізму” та недоліки “постмодерну”, будівлі такого характеру мають свою власну концепцію формотворення. В силу історичних обставин в архітектурі Львова всі фази модернізації мали вигляд коливання між крайностями – модернізму у вигляді радянського типового та неоконструктивістського про`ктування та постмодерною демодернізацією. Впродовж 2010-х років тут відбувся стрімкий перехід до нової інтерпретації авангардних принципів у проектуванні і розвилась нова архітектурна мова, що потребує свого вивчення та кваліфікації.*

Розглянуто проблему термінологічного визначення сучасних об`єктів модерністської архітектурної мови на прикладі Львова. Визначається соціальні та культурні передумови і фактори, що вплинули на її формування. В цьому контексті аргументовано використання терміну неомодернізм, як поняття, що найбільш наближено до змісту розглянутих архітектурних явищ. Виділено два основні типи неомодерних об`єктів, що виникли у львівській архітектурі в цей період. Перший з них характеризується чіткою прямокутною геометрією, в якій архітектурний образ формується низкою композиційних нюансів. Другий тип львівських неомодерних об`єктів – це динамічні композиції, в яких мета створення харизматичного образу децю переважає логіку суто функціональної морфології. Можна сказати, що подібного роду спроби інтерпретують архітектурну форму як “мову”, як це робили постмодерністи в минулому, але на відміну від останньої, ця “мова” створюється за допомогою авангардної візуальної культури, без натуралістичних та класичних пропозицій. Архітектура таких споруд – це своєрідний просторовий спосіб побудови пафосу, основними засобами якого є: великі масштаби, контрастний колір та пластична маса. Було визначено, що неомодернізм у ширшому соціокультурному сенсі можна віднести до: а) тенденції звільнення від впливу політичних та культурних інститутів (“істеблішменту”) та б) помірної критики лібералізму, як свого роду нової “примусової” ідеологічної системи поглядів. У львівському контексті, у першому випадку, варто відзначити важливе місце, яке місто відіграло у популярних виступах під час Євромайдану у 2013–14 роках, розвинуту мережу організацій громадянського суспільства, відсутність у регіоні домінуючого впливу у великих випадках олігархічних діячів тощо. У другому випадку місто протягом усього 1990–2010 рр. місто було симбіозом ліберальної вітчизняної культури (толерантність до етнічних та мовних меншин, неоднорідна культурна спадщина тощо) та традиціоналістичних моделей колективної поведінки (масові релігійні ходи, регіональна етнографія тощо).

Ключові слова: *неомодернізм, пізній модернізм, текучий модернізм, архітектура Львова.*

Yuliia Frolova

**NETWORK OF THE OTTOMAN FORTIFIED SETTLEMENTS
ON THE NORTHWEST BLACK SEA COAST
IN THE XVII AND XVIII CENTURY**

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Abstract. The article is aimed at covering the issue of the historical organization of the network of fortresses of the northwest coast of the Black Sea and the Danube-Dnepr intermarriage during the XVII and XVIII centuries, the times of subordination of this territory to the Ottoman Empire and vassal states. The study covered 11 cities that had fortification systems. Historiographical and descriptive documents on fortifications were systematized, search for common features and algorithms for the formation of a fortified area was compared with other known Ottoman cities of the same period. Generalization of architectural solutions is derived in a spatial typology.

Key words: city planning, fortress, defense lines, The South of Ukraine, fortified settlements, north-west coast of the Black Sea, ottoman fortress, XVIII century

Introduction. Overview of the level of research of the issue

The general direction of the study. The description of the architectural and spatial planning of the fortified cities is part of an interdisciplinary study of the historical – urban, cultural – social and economic – geographical development of the southern region of modern Ukraine. The art of fortification during the XVI and XIX centuries was an important factor in influencing the development of the area, a factor of spatial and architectural filling of the urban environment, social and cultural diversity, and symbolized the milieu and political power of the countries. The major cities of the northwest coast of the Black Sea, under socio-economic and political circumstances, had fortifications that strengthened and fixed the strongholds of statehood.

In 2010, a translation of one of the most interesting monographs of the last decade on the history of the Black Sea was published. This attempt to unify the historical heritage of a large number of states within a probable dating period brings the researcher into the space of universal civilization value of a geographical unit – the sea. According to the author, possession of the Black Sea was and is a decisive factor in the establishment of the statehood of the two Great Empires, the Ottoman and the Russian; the desire of principalities and communities to control at least a small proportion of the coastline. (King, 2004). These aspirations and decisive political steps have led to a constant change in the territorial integrity of the coast, militaristic and social conflicts, the start-up and prosperity of individual communities, and the creation of a large number of political myths. Competition over the control of the Black Sea waters of the Ottoman Empire and the Russian Empire for two centuries, from the beginning of the XVIII to the end of the 19th, prompted both states

to take decisive action for consolidation and expansion. The Ottoman Empire built its control by subjugating the territory to the vassal of the Crimean and Naga Khanate, which was supposed to be the protection of the interests of the Muslim world; The Russian Empire built an expansive policy on the mythological and logical liberation of the Christian community. The influence of the Nogai Khaganate of Bessarabia, the Crimean Tatar Khanate of the Ochakov Steppes and the Dnieper Hetmanate was considered to be a component of separate political programs against the background of such a prolonged conflict of imperial interests (Gribovsky, undated). Only in recent years the territory of the Northern Black Sea Uzbekistan explored as part of a much broader concept of the Steppe Edge, the Euro-Asian front.

Frontier comparativism in historical science views Budzhak, Bessarabia and the Ochakov steppes not as separate border territories between East and West, a buffer zone between Christianity and Muslims, a “wild steppe” – but as a multicultural space of interconnectedness and modality. The emergence of the Cossacks as a “phenomenon” is directly related to the decision of the state border issues of protection and control of the Polish-Lithuanian Kingdom (Chernovol, 2016), as well as the program of the Russian Empire forcibly settling the territory of the Ukrainian-Cossack people on the territory between Ukrainian and Dnieper line. The boundary, boundary term is largely a limiting tool when considering a potentially variable territory. In the context of global history, political boundaries have never been in the state of a fixed geometric unit, and have intentions for temporality. Border, border can be used as a political and documentary expression directed at the fixation of a specific territory under the protection of a single state, while the space of cultural, ethnic and social ties can mutually penetrate from one state and society to another. It is clear that history does not excuse the conventions and consolidation of concepts, and concretization of facts and logical construction of conclusions is a critical task for research.

The territory of the Danube, Dniester and Dnieper rivers is already becoming more than just a multicultural and free region, and the center of a multi-layered history with influence on the development of 8 states over 5 centuries: the Ottoman Empire, the Moldovan and Romanian principalities, the Crimean and Nagoya Khanate/ The Hetmanate, the Russian Empire. It is necessary to consider this region not only from the standpoint of historical events of an individual state, but in the aggregate, building a complex non-linear model of development.

Since the end of the XIX century, a new conceptual vision of the essence of cultural and political interaction of different states – the theory of the comparative front – has been introduced into international historical science; (Chernovol, 2016).

Formation of time and limits of research. In the XVI and XVII centuries, the frontier of the Muslim-Ottoman Ottoman Empire and Christian Europe was formed, starting from the Spanish provinces in Algeria and Tunisia, along the Mediterranean, Dalmatia, Croatia, Hungary, the Polish-Lithuanian region and the line in the Beirut region and Ukraine. Muscovy. Alfred Riber, wrote this On the development of the Northern Black Sea was largely:

- *The Habsburg Front*, which passed through the territory of the Winger Principality and the Commonwealth, along the Transdunabia Mountains and the Danube and Dniester rivers, found significant changes in the organization of the border – most European cities which had previously been fortified by the principles of the latest inventors of the militaristic revolution (Gábor, 1998). Not all cities could afford the modernization of the fortifications; the first line of reconstruction was the cities (Szigetvár, Kanizsa, Győr, Komárom, Érsekújvár, Eger, and Temesvá (Gábor, 1998), the main fortress-city being Wina. frames become Belgrade (Fig. 1).

- *Ochakov steppes*, Dniester and Dnieper rivers. They were almost entirely subordinated to the Golden Horde Khanate, which in the 16th century became part of the vassal duties of the Ottoman Empire. (Fig. 2).

- *Eastern border* with the Muscovy / Russian state along the Don and Caucasus rivers. The territory under study was included after the administrative regulation of the Ottoman Empire in the Budzhak and Ochakov districts (the territory is restricted today by the rivers Danube, Prut, Dniester, Dnieper and the Black Sea. (Fig. 2).

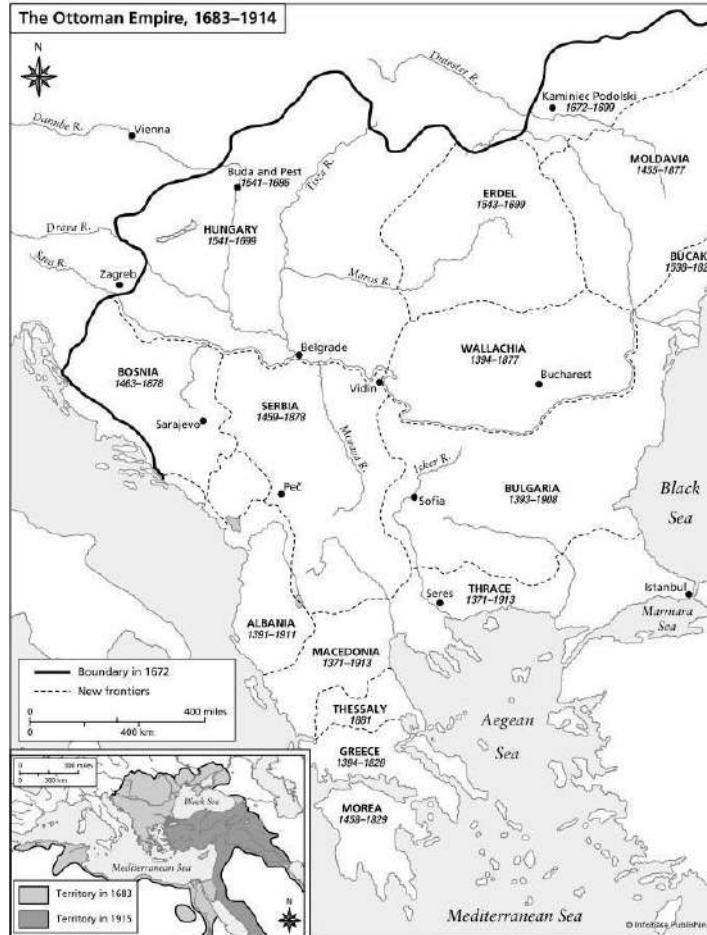


Fig. 1. Ottoman-Hasburg frontier after Gabor Agoston (Gabor, A., Masters, B., 2009)

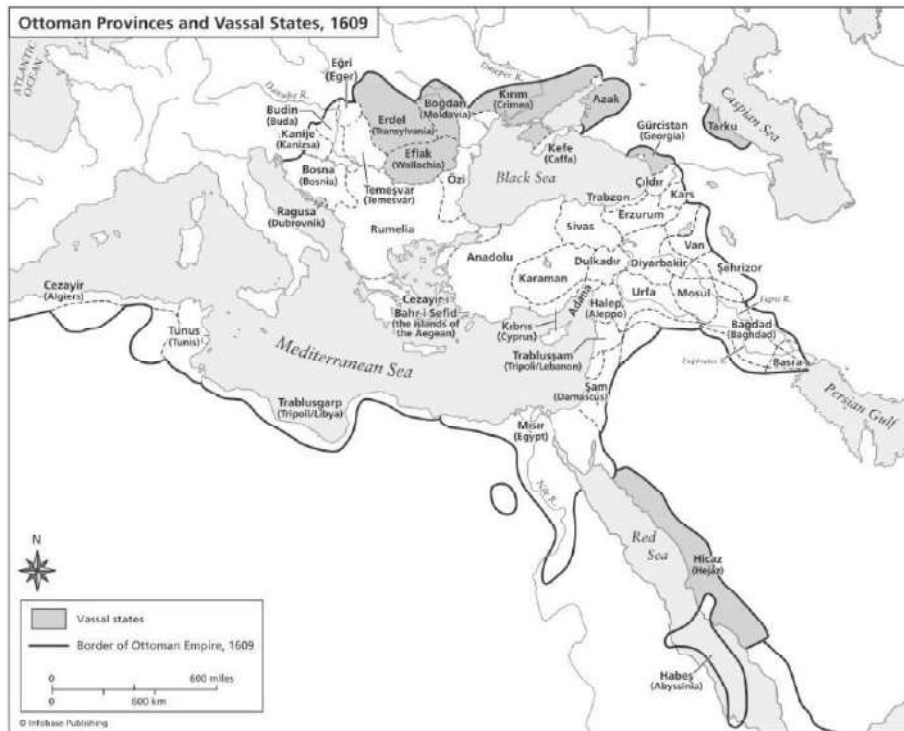


Fig. 2. Ottoman provinces and vassal states after Gabor Agoston (Gabor, A., Masters, B., 2009)

The degree of study of the region by Ukrainian scientists

Due to the biased interpretation of the history of the Tatar and Ottoman periods of domination of the 17–18 centuries and the finding of a large part of the source base in the archives of modern Russia, the speed of work on the search for a common non-conflict history is suspended. Documents that were evacuated during World War II to Moscow and St. Petersburg are still limited access for Ukrainian researchers. Known to the XX century, the published references testified only to the political weakness, incompetence of the local administration of the Ottoman Empire, and the slowness of decision-making on the construction of fortifications during the Russo-Ottoman wars by the Crimean Khanate. The skeptical attitude of the victorious country to the heritage of previous generations has pushed important features of the urban culture of the Ottoman Empire and the Crimean Khanate beyond the history of the Liberation State. An argument that is now refuted, cities and settlements begin to take root from a typical project developed in the Russian Empire (Shkvarykov, 1954) (Brunov II, Vlasyuk, Kaplun, Kiparisova, Maksimov, Chinyakov, 1956), (Hubar, 2015), and the city comes into force precisely at the will of Catherine II. Small Ottoman cities and settlements are hardly reflected in the modern history of cities in southern Ukraine (Timofienko, 1996), or mentioned in part (Timofienko, 1986).

Contemporary archeological, urban and historical studies review Soviet-formed theories and hypotheses about the myth of the land of the desert and backward, which are still based on the political propaganda of the Russian Empire. The impetus is the publication of Timofiyenko (Timofiyenko, 1986) and the staff of the scientific monograph “Monuments of Urban Planning ...” (Logvin GN, EM Godovanyuk. IM Kravets, IR Mogytych, TA Tregubova, 1985). Contemporary Ukrainian historiography seeks to find and integrate European-Asian sources in the history of the country’s development that were not previously in the scientific circulation of the country Şlapac, M., (2004, 2016), A. Sereda (Wednesday, 2009), I. Kissé (ed., 2016), I. Sapozhnikov (Sapozhnikov, 2017) (Yacubova, undated), A. Krasnozhen (2018, 2019)

Over the past two decades, foreign documents and cartographic sources have been published to supplement previous research (Timofienko, 1986) of urban development in southern Ukraine. To the international circle of scholars whose publications concern the formation and development of Ottoman and Tatar settlements, Ostapchuk (Finkel, Caroline and Victor Ostapchuk, 2005), Finkel (Finkel, Caroline and Victor Ostapchuk, 2005) Fedakar (Fedakar, 2015), S.Belyaeva (Ostapchuk V., Bilyayeva S., 2009), Şlapac, M., (2004, 2016), Even these numerous interdisciplinary studies of urban development and the architectural features of settlements are fragmentary, highlighting particular periods or finds. Higher-ups are mostly based on archaeological research and historiographical comparisons.

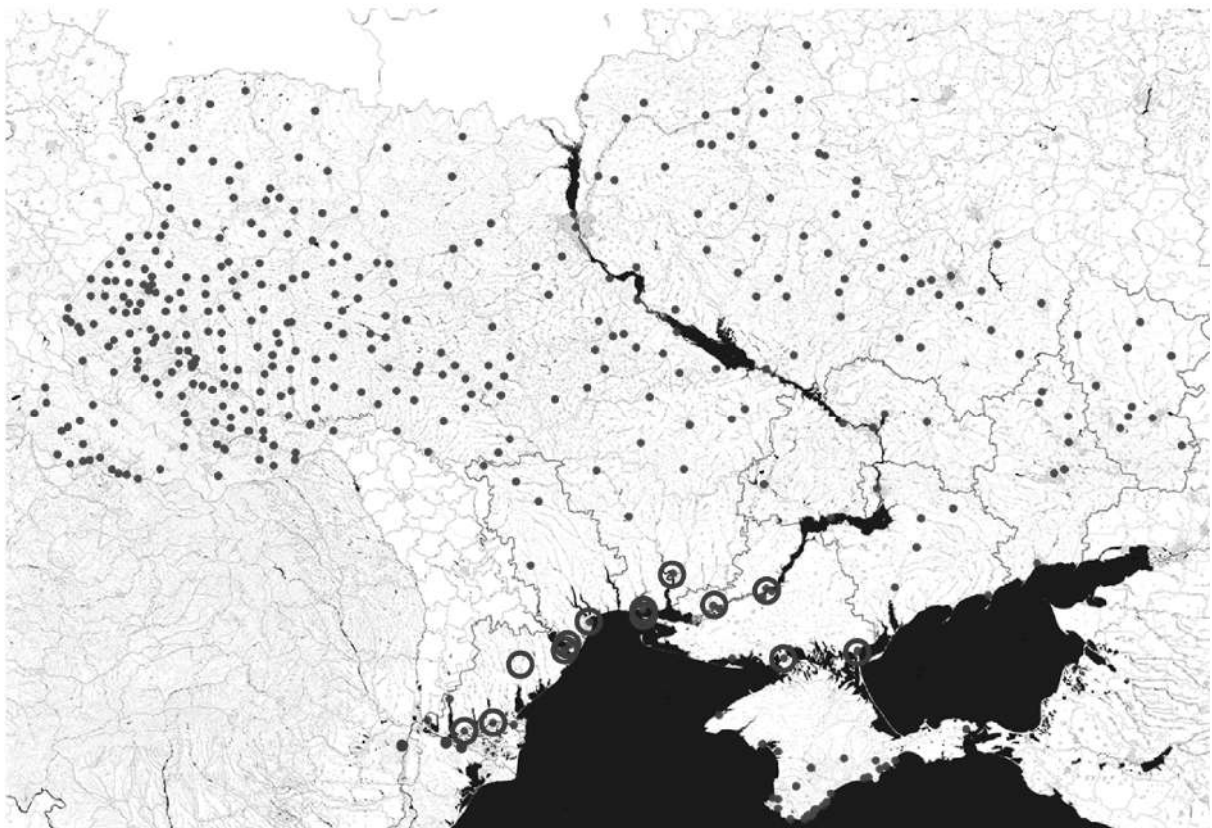
The problem of research

Town-planning studies in the territory of the South of Ukraine were carried out in the 1970s when the encyclopedic monograph “Monuments of town-planning...” was prepared (Logvin GN, EM Godovanyuk. IM Kravets, IR Mogytych, TA Tregubova, 1985), in the volume dedicated to Odessa, Mykolaiv and Kherson regions, 12 cities and towns have historical and urban significance. A separate appendix describes what kind of historical heritage items fall into the category of protection. These are estates, general planning, sacral structures, monuments. Only in one case is a fortification or fortress separately described. The town-planning significance of fortifications has been thoroughly researched and substantiated by experts who have examined the western and central regions of Ukraine (M. Bevz, G. Petrishin, O. Osichenko), considering the period of Ukrainian history from the Galicia-Volyn principality to the Commonwealth European cultural heritage. Separate consideration is the border fortifications that have long been the subject of common interest of both cultural currents of the Ottoman and Habsburg Empires. It is on the frontier professionals in the history of fortification that show a strong development of fortifications, design and planning decisions. At the same time, the territory of the north-west-west coast of the Black Sea remains in the area of tangible consideration of studies of cities and fortresses, which is more similar to the overall summation of the conclusions about the history of the Moldavian and Romanian, Lithuanian principalities, or the territory of the buffer border between

the rivers Khanate. separation of the historical and theoretical description of cities from architectural and spatial organization, the need to materialize models of cities as spatial models. To find commonalities and network connections as they relate to the general context of the Ottoman Empire. Problems of joint dating, development and spatial organization.

The purpose of the article. The aim of this paper is to summarize the principles of territorial and planning organization of the fortifications of the Ottoman Empire in order to prove the system and coherence of the created fortification network by the 18th century.

General Methods used mapping, blueprints, simulations, andthiographic and descriptive data. Methods Summary. To form a model of architectural and planning development of selected fortifications in the cities of Izmail (bastion fortress Izmail), Kiliya (medieval and bastion fortress Kiliya), Belgorod-Dnistersky (medieval fortress Ak-kerman), Ochakov, Kutuzon fortress a graphical restoration of the fortifications fortifications was carried out on an evolutionary principle, the factors of formation of spatial structures were analyzed, and the characteristic features of the objects were identified. Photo-fixing and mapping of the remains of fortifications were made, sketches of the environment were made, graphical analysis of drawings and lithographs were made, 3D models of fortresses were constructed according to historical plans and graphic reconstructions of views of the main structures were developed. In total, 11 fortification sites were selected: Kiliya fortress, Ishmael, Tatar-Bunar, Ak-Kermen, Ajider fort, Yeni-Dunia fortress and Hajjbeey fortress, Ozu fortress, Kinburun fort, Perekop fortress. The island fortresses of Berezan and Alexander. The following are to be attributed to the Ottomans: Kiliya, Ishmael, Ozu, Ak-Kerman, Perekop, Kinburun, Tatar-Bunar, Yeni Dunia, or Hajibey



- 1. Historic settlements
- ⊙ 2. Investigating areas
- 3. Addition investigating areas

Fig. 3. Map of Ukraine historic settlements after the Law. With marked invastigating areas



Fig. 4. Map of fortified settlements created by Rizzo Zannoni.

Natural and geographical factors of territorial influence

Subordinate to the vast open spaces of Budzhak and Bessarabia, the military might of the Ottoman Empire is rooted in the Habsburg Front and the European annual network that had access to the Inland Sea of the Empire – the Black Sea. Topographic corridors passed to the steppe territories and watersheds; natural relief serves as a formal marker of demarcation. While controlling the Bosphorus and Dardanelles straits, the states did not build complex schemes for territorial control of the vassal regions; instead, the location of key forts was intended to control the deltas of large transport rivers that served trade routes.

The geographical location of fort posts on rivers and watersheds formed the following types of subordination and interaction between elements of fortified territories:

1) *gate type* (F. Ozu, F. Kinburn, F. Hassan Pasha; F. Kazikermen, F. Aslan-Kermen; F. Ki-lia, F. Isakcha). It is characterized by the location along the course of rivers or small reservoirs and river deltas, so as to close the battle space between the two fortresses. Provides coherence in defense decisions, shared water corridor (Fig. 5).

2) *mirror type* (F. Hotin). The fortress is located as a counter to another fortress (Fig. 6).

3) *a chain type* (the fortresses of the Dniester and Danube rivers). The location of fortresses along the course of rivers or reservoirs, with a common function of common control over a river corridor, with a model of joint interaction: invasion, disturbance and sub-rtquest signals (Fig. 7).

4) the combined type. Considered as a collection of all the above types, with the replacement or addition of another element.

Hierarchical and economic factors affecting fortification objects

Subordinate administratively and territorially, who also had a partial right of local self-government. Three levels of communication have been identified: 1) main – Istanbul (capital) – Si-listria (Kale, the capital city-fortress of the region); 2) minor – kale (the main city fortress of the region) – kale (fortresses, fortified cities, fort posts); 3) subordinate – Kales (fort-these, fortified cities, fort-posts) – palanches, tabiyas, fortified territories. The fortified territories of the fortress were gradually formed in the suburbs, which were later strengthened by the retransmission and included in the administration of the fortress. There are examples of 2 and 3 lines of retransmittal strengthening of the mediocrity (F. Ochakov, F. Ak-Kerman, F. Khotyn, F. Kiliya).

Artistic and cultural factors of influence

According to Islamic tradition, considerable attention was paid to the compositional expression and adaptation of the canon of the Grand Tower (burj) as a major element of fortification. Thickening of the walls of the fortress was also added to the canon by the Ottomans to counter the weapons of the enemy.

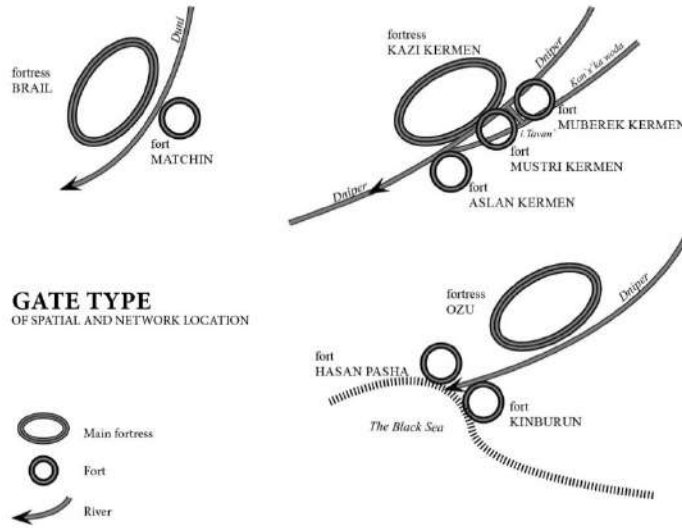


Fig. 5. Gate type

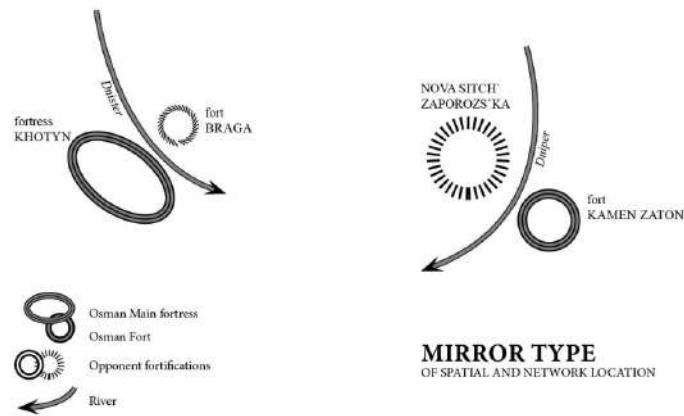


Fig. 6. Mirror type

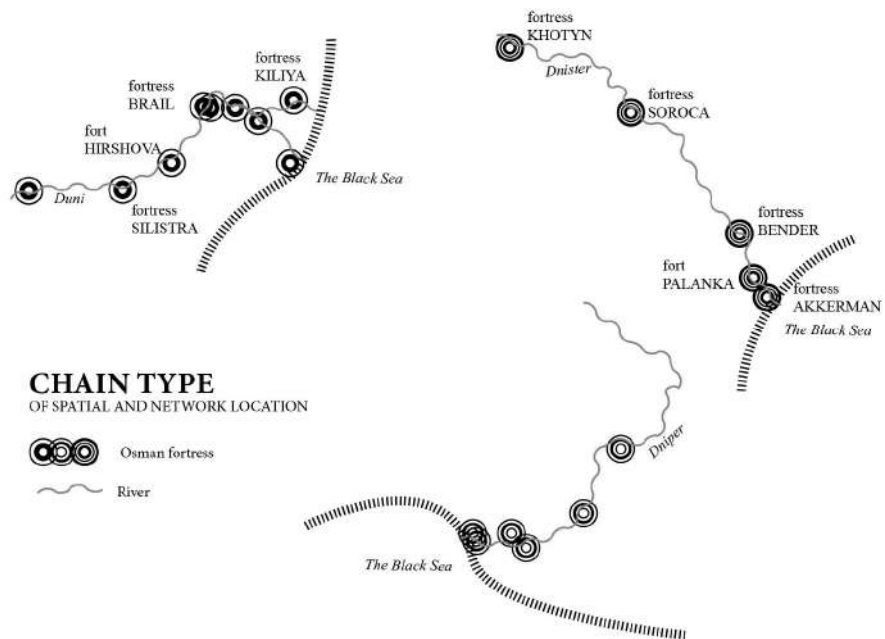


Fig. 7. Chain type

By the 16th century, significant changes had taken place in the fortification of the Ottoman Empire. Most of the fortresses were simple rectangular garrisons of the fortress in a typical project. (Nicolle, 2010). The high stone walls were largely used, already old-fashioned, in comparison with the European bastion forts. Such an influence on architectural spatial decisions had a fabulous ghost of the acquisition of Constantinople, and its aesthetic representation in the culture of the Ottomans. Constantinople, as the most powerful fortress in the city, where the walls are three-tiered and have large gates, square and polygonal towers, the pattern and colors of the walls are the same as the national colors of the empire – red and white. Citadel of Galata the prototype of the Great Tower.

In the early stages of fortification, the Ottoman Empire adapted the fortification elements (Genoese citadels, Lithuanian castles, field fortifications) by its own cultural principles at that time – not to destroy and enhance the cultural features of the area. Due to the “no damage” approach, significant layers of historical landscapes have survived – the Genoese-Venetian presence on the Black Sea, Lithuanian towers and Nogai-Tatar settlements. The alterations concerned only religious and symbolic structures.

Fortresses of southern Ukraine con. XVII – middle of the XIX century. also characterized by restructuring and reconstruction of previous construction periods for the needs of the Ottoman Empire. The experience of local masters was used, and the traditions of the Ottoman semantic filling of the fortification objects (the White Tower – Galatasaray Tower, the city walls – the walls of Constantinople Istanbul) were integrated into the space of the previous settlements laconically, preserving the fabric of the city and its ethnic features. The modernization and transition of the fortification planning solution from medieval methods of construction to bastion tenets of the tonal type was influenced by Franco-Ottoman political relations after the first attempts to modernize the Ottoman army in the XVIII century. The major changes take place on paper, with the modernization projects touching on much later, almost at the end of the XVIII century. Rebuilding of the fortresses by the French and Austrian schools of fortification of the tonal and bastion type of fortifications was implemented with considerable inhibition and obstacles among the military. Low earthen bastions and stone moats, stone walls of medieval citadel, adapted to administrative functions, lines of defense complemented by new form-ravelins and redans.

The towers and gates of the medieval Ozu and Kilia fortresses are completely dismantled and replaced by earthen bastions with moats and polysades, the citadel fortresses are used as administrative structures or ancillary buildings, gradually being completely dismantled. The street layout grid switches to a regular rectangular or beam. The surroundings of the fortress are adapted to the voice, increasing the defensive fortifications, small earth bastions replacing the stone towers. The Kinburn Fortress is being rebuilt according to the French Fortification School and strengthened by the Ravelin auxiliary from the Dnieper Estuary.

Conclusion

It was established during the study that not all fortifications have any available drawings of plans, sufficient source and research base, partially missing lithographs of later periods of remodeling, records of archaeological investigations of the fortification sites in the early twentieth century, which in turn directs researchers to expand international source search and collaboration. At present, the types and features derived are based on preliminary considerations and hypothetical conclusions, and the spatial organization models themselves should be specified in the original.

The territories designated as the steppe European frontier between the East and the West are accompanied by a developed system of fortifications that are significantly different from the European fortification tradition of fortification. Fortresses and fortified cities are located on natural watersheds along large transport rivers, which has made it easier to control territories and ethnic groups. The Ottoman Empire, having inherited a large number of already developed powerful Black Sea shopping malls, does not aim to expand these networks with new facilities, but is gradually strengthening and modernizing them. Spatial transformations are hardly traded on the fabric of the city, and previous fortifications are stored in a significant amount of construction.

At that time, a new system of territorial control was developed, its 3-tier hierarchical model allocating responsibility for the territory and socio-economic responsibilities of the controlled areas. The spread of small taboos and palanquins of the Budjak territory has not yet been discovered, since the territories are used in agriculture, but based on Romania's inheritance, it can be assumed that such a network also existed between the Bug and the Dniester. Other territories – Bessarabia – were controlled by the nomadic settlement of the Nogayans, who also formed armed support for the Crimean Khanate and the Ottoman Empire, protecting and regulating movement across the territories between the Dniester and the Dnieper. An important question to which is still unanswered is whether temporary fortified points were distributed among nomadic tribes, as the urban and fortification movement has not been identified at all.

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Юлія Фролова

МЕРЕЖА ОСМАНСЬКИХ УКРІПЛЕНИХ МІСЦЬ ПІВНІЧНО-ЗАХІДНОГО УЗБЕРЕЖЖЯ ЧОРНОГО МОРЯ У XVII ТА XVIII ст.

Анотація. Дослідження архітектурно просторового планування укріплених міст є частиною міждисциплінарного дослідження історично-містобудівного, культурно-соціального та економіко-природнього характеру розвитку південного регіону сучасної України. Мистецтво фортифікації упродовж 16–19 століть було важливим чинником впливу на розвиток міст, їх розміри та архітектурний вираз,

соціальний та культурний склад території, символізували міліарну та політичну міць країни. Більшість міст північно-західного узбережжя Чорного моря за соціально-економічних та політичних обставин мали лінії фортифікаційних укріплень побудовані у різні часи та за різними фортифікаційними традиціями. У якостях фортифікаційних укріплень проявилась напрямом функціонування поселення як потужних портів або торговельних площ з використання розгалуженої системи підпорядкування оточуючої території та середмість. Дослідження охопило 11 міст, які мали фортифікації упродовж 17 століття. Було систематизовано історіографічні та описові документи щодо фортифікацій, зведено у табличну форму, проведено пошук спільних рис та алгоритмів утворення міського простору, порівняно з іншими відомими османськими містами того ж періоду. Отримані архітектурно-просторові моделі фортифікаційних укріплень об'єднуються у загальну мережу фортифікацій з тотожною організацією та підпорядкуванням міського простору за зразком державного рівня Османської Імперії, поділяються на другорядні та підпорядковані зв'язки. В залежності від природно-економічних чинників було виділено 4 типи фортифікаційних просторових зв'язків (брамовий, дзеркальний, ланцюговий та комбінований), обрані об'єкти мають спільні історичні та просторові характеристики (початок формування фортифікацій від литовського та генуезьського періодів, татарська та ногайська перебудова, османська модернізація, період занепаду). Просторова єдність розвитку укріплених міст північно-західного узбережжя Чорного моря та їхні спільні архітектурно-просторові риси уможливають реконструкцію об'ємного вигляду тих містечок, які мають обмежену джерельну базу. Також актуалізує питання перегляду містобудівного руху та характеру організації фортифікаційних споруд у період володарювання Османської Імперії XVII та XVIII століття

Ключові слова: планування міста, фортеця, оборонна лінія, Південь України, укріплені поселення, північно-західне узбережжя Чорного моря, отаманські фортеці, XVIII століття

Lucjan Gazda¹, Mykola Bevz²

**MATERIALS AND ARCHITECTURAL DETAILS
FROM NATURAL AND ARTIFICIAL STONE OF KING DANIEL
ROMANOVICH'S XIII CENTURY RESIDENCE IN CHOLM**

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Abstract: Materials obtained during archaeological excavations on the place of castle in the city of Cholm (today Chełm in Poland), in the area of king Daniel's 13th century residential complex, have been subject to examination. They are in the forms of bricks and glazed tiles, as well as sizeable shapeless and purposeless accumulations indicating post-manufacturing remains. The materials are white, green and multi-colored. They refer to Halychian alabasters and green glaukonite from Cholm, which were originally used there. The examination of white materials was performed. The conducted examination indicated that the materials in question were manufactured using other than ceramic technologies, but similar to the ones used to produce silicate materials nowadays. As raw materials, chalk and biogenic silica obtained from a horsetail were used. The petrification procedure was conducted in hydrothermal conditions. As a result a material structurally similar to marble was obtained.

Key words: archaeological excavations, architectural details, natural, stone, artificial stone, construction of residence, Cholm (Chełm), XIII century.

Problem statement

Presented work is part of the project "The northern part of the princely residential complex in Chełm" (number 2014/13 / B / HS3 / 04930), financed by the National Science Center and implemented by The Institute of Archeology and Ethnology of the Polish Academy of Sciences in Warsaw under the direction of professor Andrzej Buko.

The foundation of capital city of Cholm (Chełm, in polish language) in the thirties of the 13th century by Daniel Romanowich (1201–1264) was most likely realized from scratch, within the period of stormy political and military turbulences in Europe taking place in the first part of XIII century. The occupation of Constantinople by crusaders of the fourth crusade resulted in exerting strong influences of Latin culture on the Halych-Wolodymyria Duchy virtually from all the sides (Voytovych, 2014). In the architecture, it was the time

of fully matured Romanesque and the breakthrough of Gothic technical and technological solutions. The use of white and green stone in the architectural detail of St John Chrysostom's Church (Halych-Wolhynia Chronicle) within Cholm acropolis was not accidental. The excerpt from Halych-Wolhynia Chronicles describing St Chrysostom's Church: "... He built St. John's Orthodox Church to be outstanding and flawless. Its structure was as following. Arcades 4, there was a vault from every corner, and their foundation on four human heads created by some master. Three windows, embellished by Roman glass (stained glass windows). Approaching the altar, there are two columns, all made from stone, on which there are an arcade and a dome decorated by golden stars in a glaze background. Its inner floor (it relates to the orthodox church) was cast in copper and pure lead gleaming like a mirror. Its two doors, ornamented by Halych white and green hewn stone from Cholm, were sculptured by a master called Avdiy (with) ornaments (in) all colors and gold. At their front (i.e. in the west portal) there was Savior, and at the north part, St John who aroused the feeling of astonishment in viewers" (Buko, 2016, p. 224).

The description in chronicle proves that the architectural and structural solution of a building was made at the highest technical and artistic level of its own time. The use of stained glass windows, stone sculpture (heads on columns hewn from whole stone), gold-plated polychrome, Cholm hewn green and Halych white stones in the decoration of door portals, ornaments in all colors and gold, the creation of floor in the unique way from plates cast in copper and lead - demonstrate that it was architectural and artistic action focused on obtaining the ideological result. It may be possible that the location itself in the area where green glaukonite meets white chalk was the stimulus for the implementation of this program. The sacral, royal and representative objects of early Byzantium Christianity, the Empire of Charlemagne, or finally, architecturally perfect Roman cathedrals, especially the ones that were inspired by the Pisan School formed in the second part of 12th century, all were arranged in green and white colors. Consequently, in such a context, the special attention shall be paid to the scale and direction of urban and building actions of Daniel Romanowich who founds the series of new towns, builds a new capital city (the action having no analogy in the east European history of the 13th century), builds in a very short time four new temples in Cholm, and after the fire in 1256 rebuilds them. The very significant professional and technical issue described in the chronicle which caused rapid development and high technological level of civil engineering in Cholm – "... Daniel saw that God helps this place, he started calling craftsmans – Germans, Ruthenians, different tribes, Poles went day by day and youths, and all kinds of masters escaped Tartars, saddlers and archers, and thulnics (producers of quivers), blacksmiths of iron and copper, and silver, and there appeared life and they filled courts around the town, fields, villages. He built the St John Orthodox Church to be beautiful and ideal" (Buko, 2016, p. 224). This church could be made as a result of construction, technological and artistic experience connections of professionals from Ruthenia, Poland and other parts of Europe. It is most likely that there was the atmosphere of healthy competition and experimentation (Bevz et al., 2015). The chemical and petrographic research on mortars used in the construction of other King Daniel's facility in Cholm – the Cathedral Church of the Blessed Mother of God (Hutzuliak, Shevchenko, 2015, p. 196–206), confirms the experiments with construction materials in the 13th century.

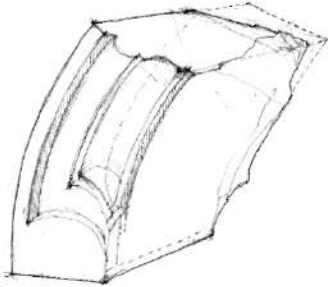
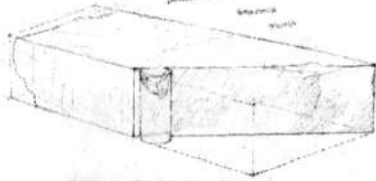
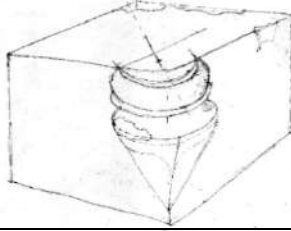
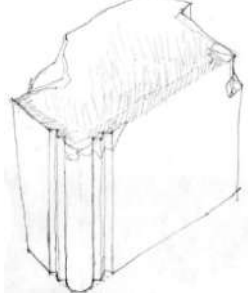
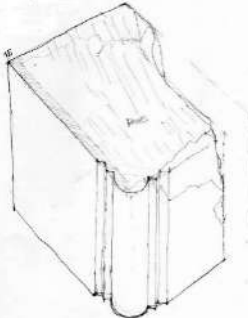
Architectural decoration connecting the green of Cholm glaukonite and the white of Halych alabaster brought Cholm to the sophisticated Byzantium patterns and Roman Europe, familiar to Daniel from direct and indirect connections (Dąbrowski, 2012). Materials, used to the implementation of this architectural and technical establishment, were yet poorly known (Halych), and in the case of glaukonite, not verified in use at all. Alabaster turned out to be not resistant to high temperatures of fire which devoured acropolis facilities in 1256. Similarly, glaukonite proved to be not resistant to atmospherical factors, intensified by the action of fire. The problem in the recreation and maintenance of the concept of these ideologies during the reconstruction after the destruction, was considerable dismissal of Cholm from the sources of approved construction stone materials applied to Roman buildings preserved until now. For instance, white and green marbles as well as Tuscan green serpentinites. As far as, there were the resources of green glaukonite at the disposal of then investors, a white stone posed the problem. It was most likely that the expensive transportation of alabaster was not repeated from the regions of Halych, which failed in the first uses, yet it could possibly be unavailable due to political reasons (Dąbrowski, 2012).

Presentation the materials of studies

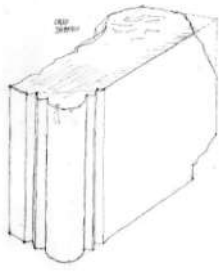
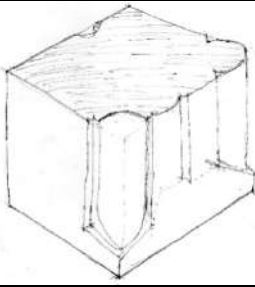
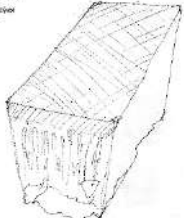
Building materials and architectural details from natural stone

Presentation of high skills and an excellent showcase of the Cholm stonemason's craft are architectural details made of glaukonitite and limestone – vertical profiled elements of the pillars (portal), elegant corner locks, archives of the portal (or window frame) made of glaukonitite, as well as limestone carved fragment head with a palette motif perfectly and delicately carved.

Table 1

	№	Description of details	Drawing of details	Material and dimensions of the detail
1	2	3	4	5
Stone architectural details from the archaeological studies	1	Fragment of archivolt of arch. The face is profiled with a quarter fillet, half roll and base		glaukonitite
Stone architectural details from the archaeological studies of King Daniel's Castle (a study led by A. Buko)	2	Glaukonitite block with sloping surface and three-quarter roller		glaukonitite
	3	Corner block with bracket under the column		glaukonitite
	4	Glaukonitite corner block with half column and twin flutes on both sides and with sloping back face		glaukonitite
	5	Glaukonitite corner block with half column and double flutes; wide		glaukonitite

Continuation of table 1

1	2	3	4	5
	6	Glaukonitite block with half column and double flutes on both sides; narrow.		glaukonitite
	7	Glaukonitite block, rectangular, profiled with two nozzles – half roll and quarter fillet		glaukonitite 425×350×350 (палац)
	8	Glaukonitite block with sloping lateral surfaces. The upper surface is sanded		glaukonitite

Gesso building blocks of glaukonitite stone

A large number of glauconitic stones have been found in excavations. It acted as building material for walls in the form of hewn blocks. Such blocks can be divided into two groups: 1 – blocks in the shape of a parallelepiped and surfaces are sanded on all sides; 2 – blocks in the form close to the parallelepiped, which are cut and sanded only on the front; and the other sides have a broken surface and rough. The peculiarity is that these blocks were often reused in later buildings.

Table 2

Block No.	Gesso building blocks of glauconitic stone	D length	H height	W width
1	2	3	4	5
13	ordinary, rectangular	210	145	270
	ordinary, rectangular	355	280	295
25	ordinary, rectangular	410	210	250
	ordinary, rectangular	210	130	
20	ordinary, rectangular	270	230	
19	ordinary, rectangular	210	145	240
8	ordinary, rectangular	284	210	210
14	the surface is stuck	215	135	123–135
	ordinary, rectangular	223	150	150
16	rounded	–	110	160
33	oblique surface	400	200–210	230
13	oblique surface	280	215	190
4?	slanting surfaces	273	150	170
20	ordinary, rectangular	250?	190	230?

Continuation of table 2

1	2	3	4	5
21	ordinary, rectangular	–	80	–
30	trapeze	310-110	150	340
	limestone, ordinary, rectangular	210	150	200?
	ordinary, rectangular	–	80	–
4?	ordinary, rectangular	–	130	–
30?	bar form	280?	130	130

From the information in Table 2, the most common sizes of stone blocks are – blocks height of 130–150 mm; less common blocks 190–210 mm high. A known feature of Romanesque construction is the use of stone wall technology “opus emplectum”. Masonry in similar technology requires the use of inverted wall positions (internal and external line of blocks) of well-cut stone blocks of equal height. The horizontal layers of blocks may have each of their own height dimensions and differ in the height of the strips in the wall structure, but it is important to maintain the block height standard in the layer. Block length, however, does not play a key position in bricklaying. It can be any. The table shows that the dimensions given are in certain standards. We can conclude that the walls of the buildings of castle in Cholm most often used layers of blocks with a height of 130–150, 210–230, 270–280 mm.

Carved architectural elements of glaukonitite stone

Glaukonitite stone is also found in the form of architectural details with carved elements. As a result of archaeological research, about 50 such details have been identified today. Some of them (about 20 details) belong to the so-called P. Pokryshkin collection – from excavations made in 1911–12 in the southern part of the hill. The rest of the details have been unearthed in the last 8 years.

A separate group consists of hewn blocks having one or two beveled surfaces. These are the elements of window or door, that formed the sloping planes of the glyphs. There are several such details (Table 1). First of all, it is a glaukonitite block with a sloping surface and a three-quarter roller. The most probable version is that it is a corner internal fragment of the window glyph. In Romanesque architecture windows with a roller or a half-roll in the framing of openings were very popular. An example of such is the preserved window in the Presbytery of the church in Imielno [Z. Swiechowski, s. 115].

An interesting is a glauconitic block with two sloping surfaces on the long side (Table 1; p. 8). The smooth upper rectangular sanded surface indicates that it is an element of a granular column or a rounded vertical wall. The scorched layer on the face confirms this, indicating that the block was interior.

All these architectural details can be divided into several groups:

- The largest group is the profiled corner blocks with a half-roll (there are 8 in Pokryshkin excavations and 7 new); (p. 4–6 in Table 1);
- Another group is profiled blocks with quarter fillet, half roll and vertical rods (1 new block and 3 blocks in Pokryshkin's collection); (p. 7 in Table 1);
- Curvilinear blocks with quarter fillets (three found); they were part of the archives of the perspective portal arch.

Analysis of the architectural forms of these details allows to draw conclusions about their belonging to the following parts of the castle buildings:

Prospective Romanesque portal. A number of details indicate that the Romanesque architectural tradition of constructing an entrance to the main buildings in the form of a prospective portal was realized at King Daniel's castle. It is possible to assume that in such forms the main entrance to the castle church of St. Ivan Chrysostom was erected. The presence of portals of such forms and their architecture is evidenced by glauconitic details both from the Pokryshkin collection and from the excavations of 2015–2017.

We present a hypothetical reconstruction of the plan and the facade of portal that adorned one of the castle buildings (Fig. 13). The reconstruction was performed on the basis of the analysis of the sizes and shapes of architectural details.

Chronicle information that the portal in the church of St. Ivan Chrysostom was made of green and white stone and is supported by indirect evidence. Most of the details we attribute to its structural elements are made of green glaukonitite stone. But in the collection we have a fragment of a carved capitul of white limestone and a small fragment of a profiled arch of great radius. We can assume that they belonged to the portal. One can hypothesize that white was the eaves of the portal impost as well as one or two bands of archivolts of the semicircular top of the portal.

Fragment of a thread of a carved white stone capitul or a corner element of cornice. This is a small piece of detail, measuring only 90x50 mm. It has symmetrically made two curls and rectangular simple abacus. The abacus belt has a height of 42 mm (Fig. 1). The detail features a very delicate embossing and delicately sanded limestone surface. The carved shape of the curl with the through drilled holes has intarsia – inserts of green glaukonitite. This is a very original artistic decoration, which is not found in other Romanesque monuments in Poland and Ukraine.

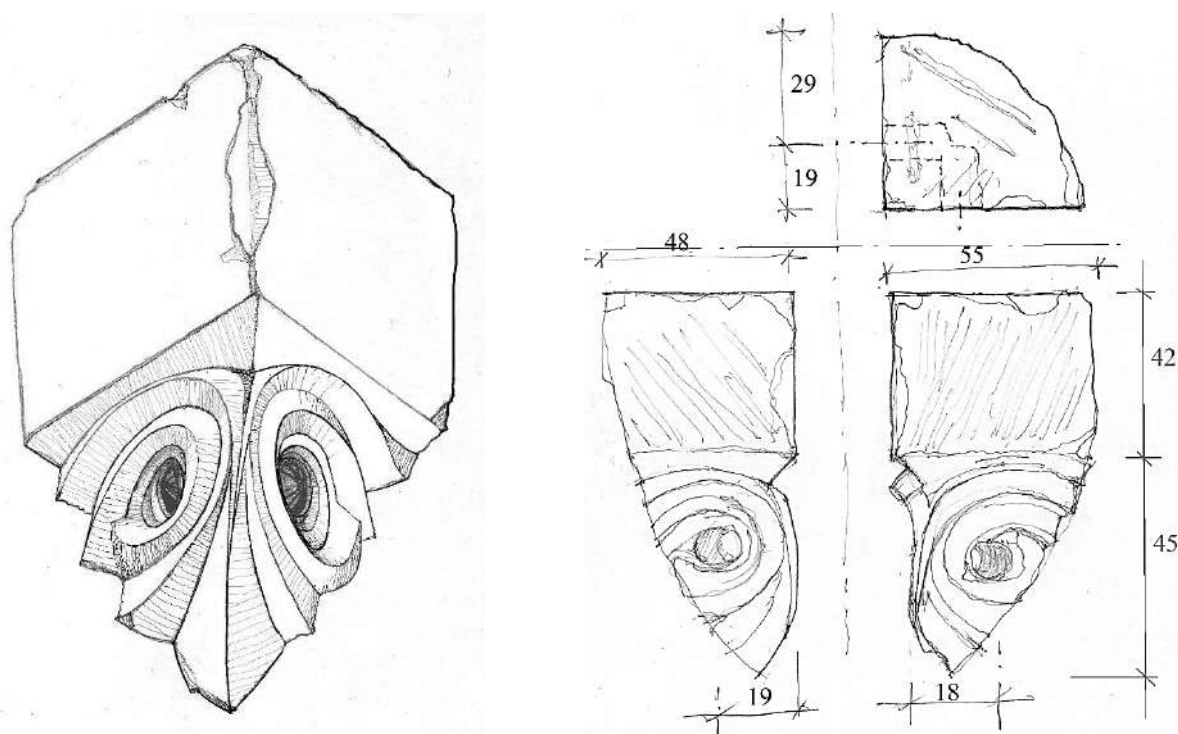


Fig. 1. Fragment of a carved detail of white limestone (fragment of the capital? Excavation CH/G/W-67/2016) with drilled holes and inserts of green glaukonitite sandstone (prepared by M. Bevz)

Building materials from artificial stone

Last archeological studies of foundation relics of the Cathedral Orthodox Church of the Blessed Mother of God in Krylos-Halych also demonstrate the alteration of construction approach in this facility in the XII–XIII centuries. Within the first stage, the cathedra was built from the white alabaster stone, then it was widened and rebuilt using the white limestone. This technological change took place as result of state evaluation and failure of the first material (Lukomskyi, Bevz, 2012, p. 26).

The lack of white stone resource in Cholm caused the demand for experimenting with petrification of chalk – soft rock abundantly available locally. The beginning of intensive exploitation of chalk in Cholm came in the 13th century. The use of limestone from baked chalk to mortars gave the knowledge that traditional heating or sintering did not bond loose structure of chalk, but it led to the creation of quicklime, air binder. There was the demand for ‘the philosopher’s stone’ necessary to transmutation. Since the 11th century, white porcelain, which had to inspire the creation of artificial white stones, has been known in Europe through the contacts with the Muslim world. White materials, found during archeological studies (Gołub, 2013) were

considered so far to be ceramic, however, during more thorough analysis, they turned out to be materials obtained from chalk, and not from white firing clays.

The research study on petrification and mineral materials filling this “alchemic” retort is performed in this article. According to the obtained results, it can be stated that within the frame of conducted experiments, the petrification of chalk with the use of active biogenic silica contained in a horsetail could be carried out, conducting the process in the hydrothermal conditions.

The materials obtained from the eastern profile of excavation no. 23 were subjected to analysis, where the object of distinctly outlined rectangular shape and vague purpose was initially documented (Fig. 2, from the left), which is accompanied by intentional accumulation of chalk (Fig. 2, from the right). This object is located beyond residential arrangements at the east bank. Archeologically, they can be dated for the 2nd or 3rd functioning phase of Daniel’s residential and sacral complex, after the destruction of outer walls and raising the ground level, so after the fire from 1256.



Fig. 2. Eastern wall of trench no. 23 within the residential and sacral complex at Wysoka Gorka in Cholm (photo S. Golub). Retort synthesis of limestone from chalk (left) and chalk raw material (right)

The samples from the object, which were operationally called as retort (Fig. 2, from the left), were taken to the research. At the upper part of the object, there is little modified white and grey chalk (Fig. 3, *a*), below light white and grey raw material, harder and more compact than chalk, with distinct replicas of plants stems of segment structure and longitudinal ribs. These replicas have the form of longitudinal negatives as well as longitudinal and transversal cross-sections of stems and leaves of plants morphologically corresponding to a horsetail (*Equisetum* L.) (Fig. 3, *b*). The organic substance has not been preserved. Inner and bottom parts of retort are filled with hard, structurally homogeneous (microcrystal) light grey and white material, cracked of distinct shell and an irregular sharp-edged burring fracture (Fig. 3, *c*).

This material at the macroscopic view (structure, sound during impact, strength to stroke and hardness) can be treated as well sintered white ceramic. However, the reaction itself with hydrochloric acid clearly indicates that this material is almost purely carbonate. Thus, this material has got the form similar to rocky limestone, obtained by no means in the technological process, it is not a rock but an artificial stone. The sequence of these materials, within the area of the same object (retort) is most likely, the record of local

petrification technology of writing chalk, useless as a construction stone, hard stone material, similar to the properties of rocky limestone applied to contemporaneous objects e.g. of Cracow or imported marbles. Without a doubt, they could also replace white Halych stones (alabaster) which were subject to destruction in the fire of the first buildings of complex (Gazda, 2016).

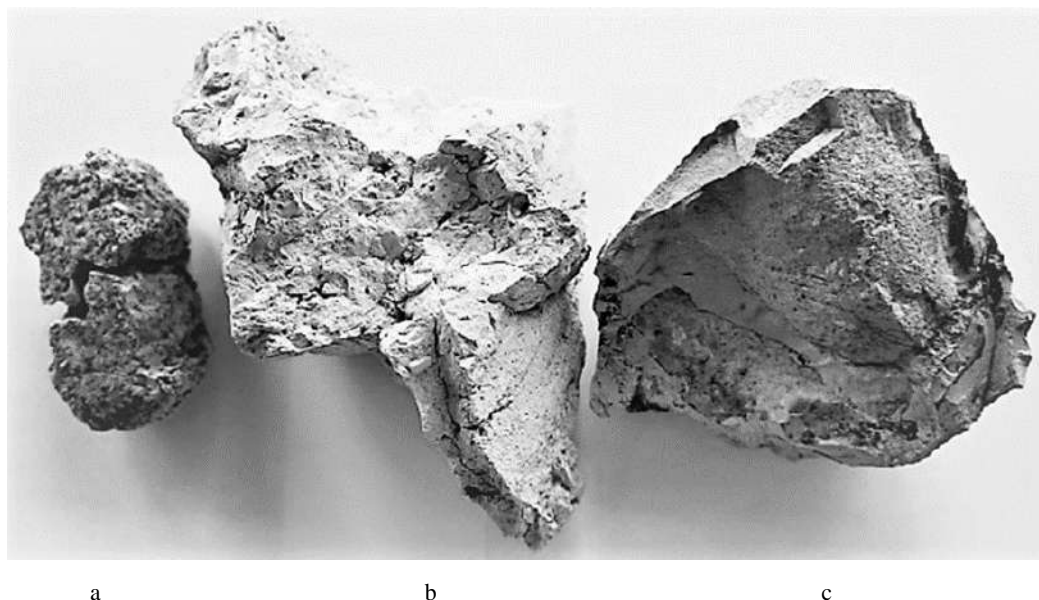


Fig. 3. Sequence of materials and materials from the retort: writing chalk (a), partially modified chalk with horseshoe replicas (b), microcrystalline carbonate (c)

This material was applied to the fabrication of homogeneously white building and archeological formats found in destructs of Wysoka Gorka (Fig. 4) as well as most likely to the production of white glazed tiles (Fig. 5 and 6) found in Cholm, Stolpie and Bielawin.

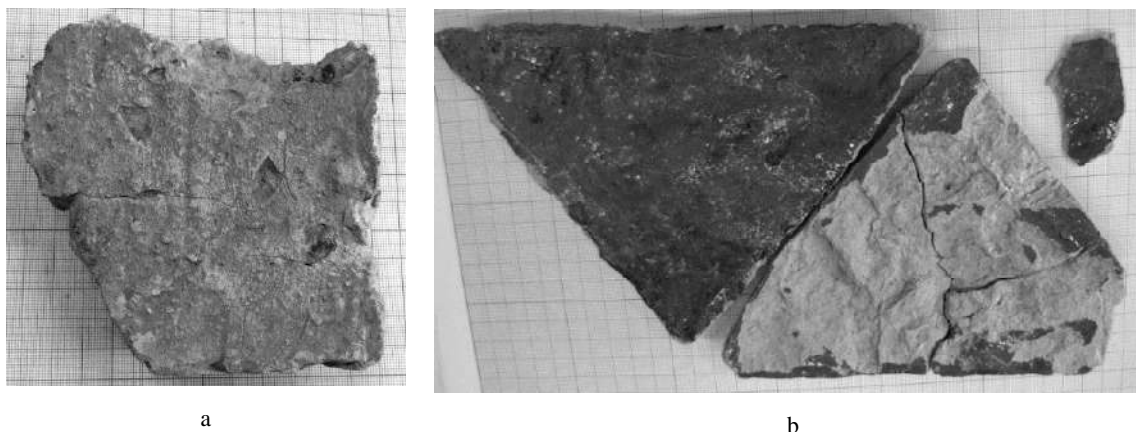


Fig. 4. Building materials obtained from materials synthesized from Cholm chalk. Fragment of a brick or architectural detail (a), glazed tiles (b)

Analysis

The materials taken from retort underwent the research: writing chalk, partially modified chalk with replicas of horsetail as well as microcrystal carbonate material (Fig. 3). Phase studies were performed with the use of polarizing optical microscope, electron microscope SEM and X-ray diffraction. The chemical analysis in the micro area with the use of electron microscope SEM with EDS module was also carried out.

Cholm writing chalk is a typical loose biocalcarenite of dominating hole saw bioclasts in its structure (Fig. 5). In mineral terms, it is a pellicle calcite (above 95 % of CaCO_3) with an insubstantial admixture of loamy minerals, quartz and iron sulphides. It is a soft rock, subject to liquification after adding water and prone to be molded in the plastic state.

The material, in the middle part of retort (Fig. 3, b), is in light grey and white, harder and more bound than the chalk as well as it is not susceptible to plasticity after adding water. There are a lot of stem replicas of plants with segmental structure and longitudinal ribs. In the view of scanning microscope, the structure of horsetail surface is clearly legible (Fig. 6).

In the chemical content of this material, a considerable increase of silica share is noticeable (Fig. 7).

In the microscopic view, strong amorphization of chalk structural elements (bioclasts), cement binds creation and embryonal crystallization of calcite are significant components (Fig. 8).



Fig. 5. Biomorphic structure of Cholm chalk writing in the image of scanning microscope

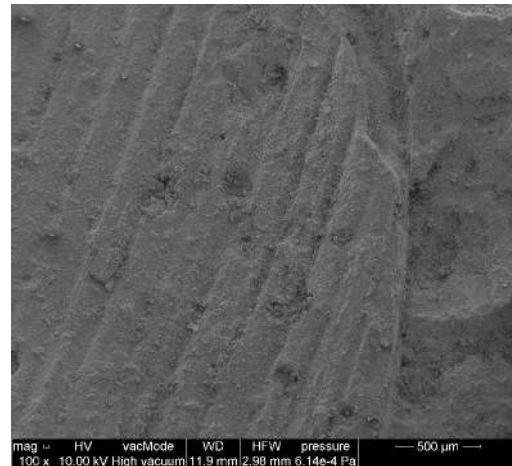


Fig. 6. Replica of the surface of a horsetail in a carbonate matrix. Image from a scanning microscope

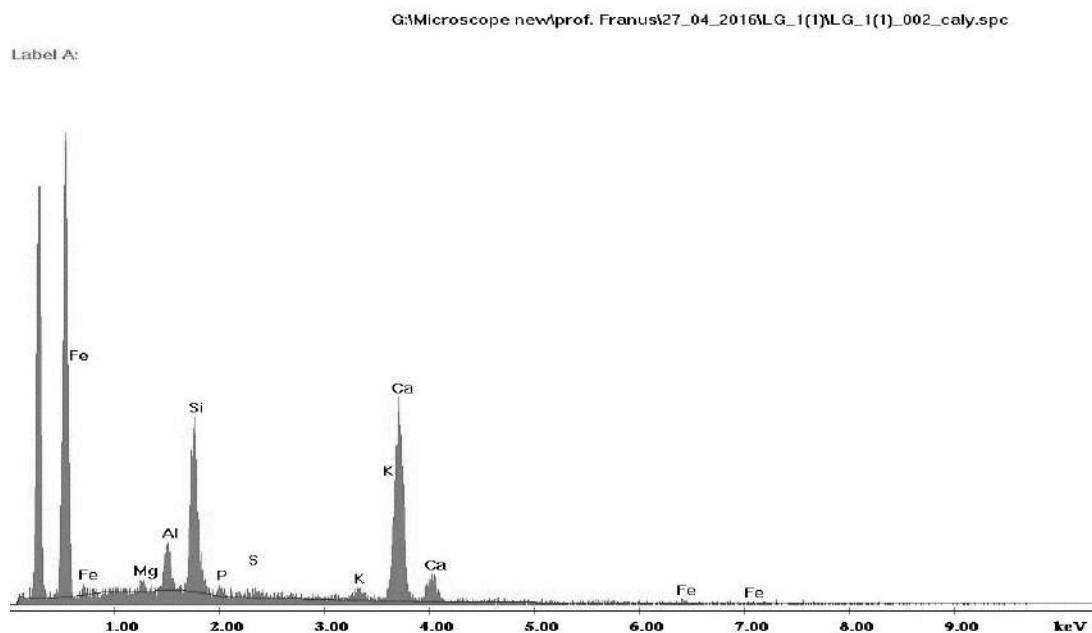


Fig. 7. Results of chemical analysis of EDS SEM plastic with replicas of horsetail stems

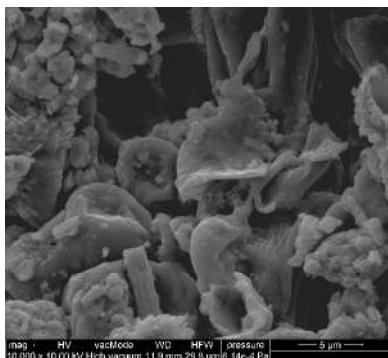


Fig. 8. Amorphisation of chalk and initial calcite crystallization

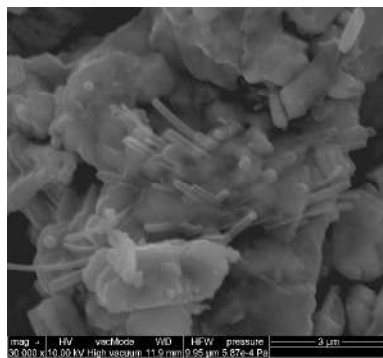


Fig. 9. Steric silica mineralization on calcite crystals

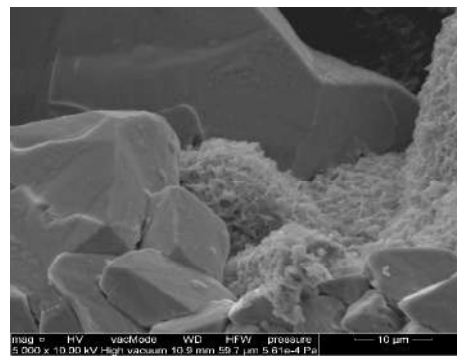


Fig. 10. Crystalline construction of the material obtained by petrified chalk writing

In the microscopic view, the steric capillary silica mineralization (max. 0,1 μm in diameter and 2–3 μm in length) could also be observed, they bind microcrystals of calcite of dimensions to max. 5 μm (Fig. 9). Silica is opal and microcrystalline in its nature. This petrographic material can be defined as silicated limestone having its counterpart in Jurassic massive limestone.

The material from the bottom part of retort (Fig. 3, c) is macroscopically light yellow and white without distinct structural and textural principles. It is cracked along with the shell surface of unbundling. The material is hard, while stroking it makes soundless noise, In addition, it is fully durable in water.

In the view of scanning microscope, structurally this material is fully crystallized (Fig. 10). Calcite microcrystals of the dimensions 5–20 μm automorphically adhere tightly to each other.

In the spaces between calcite crystals, there is silica grouting of distinct crystalline structure and cellular texture (Fig. 11).

Calcite has got clear and symmetric diffractive lines, which indicates its well ordered structure. Silica within the angle range of 20–25 $^{\circ}$ 2 θ produces diffractive lines characteristic for opal-CT (cristobalite/tridymite) (Jones, Segenit, 1971). Semiquantitative determination of contents of mineral phases on the basis of their diffractive lines enables establishing the calcite content of about 90 % and silica 10 %. This material can be petrographically (mineral and structurally) defined as silicated fine-blastic marble.

Conclusions

Performed phase studies on materials taken from the object which was operationally defined as retort, confirm their carbonate nature. They are the transformation recordings of soft dissolveable writing chalk into the material similar to rocky limestone until obtaining the material with technical values close to marble. It can be inferred from the conducted archeological observations and phase studies that the aim of alchemic activities was to obtain (transmutation) from the soft white chalk, the material which could be a substitute for, unavailable in this region, white building stones (alabaster, limestone, marble). Chalk is generally available white rock in Cholm and surroundings, however, due to the lack of durability in the changing weather conditions, it is totally useless to construction and architectural purposes. The petrification of chalk was performed by recrystallization of its biomorphic structure within the frame of hydrothermal processing in the atmosphere of amorphous silica whose source was a horsetail. On the basis of the content of silica in the hard material and the silica content in the horsetail at the level of 6–8 % in the dry matter, it can be assumed that about 20–30 % of horsetail additive was used to chalk suspension. Chalk petrification was performed by recrystallization of its biomorphic structure in terms of hydrothermal processing in the environment of amorphous silica whose source was the horsetail. On the basis of silica content in the hard material and silica content in the horsetail at the level of 6–8 % in a dry matter, it can be assumed that there was about 20–30 % of horsetail additive to chalk suspension. During the process of boiling, silica was released and became the transformation inhibitor of calcium carbonate which, through the initial phase of amorphization, transformed into the completely crystalline form. The morphology of

horsetail in the conducted process underwent full annihilation. In addition to recrystallized calcite, silica also became a structural and cement element of created material within the frames of opal transformation into the crystalline forms of cristobalite and tridymite (opal CT).

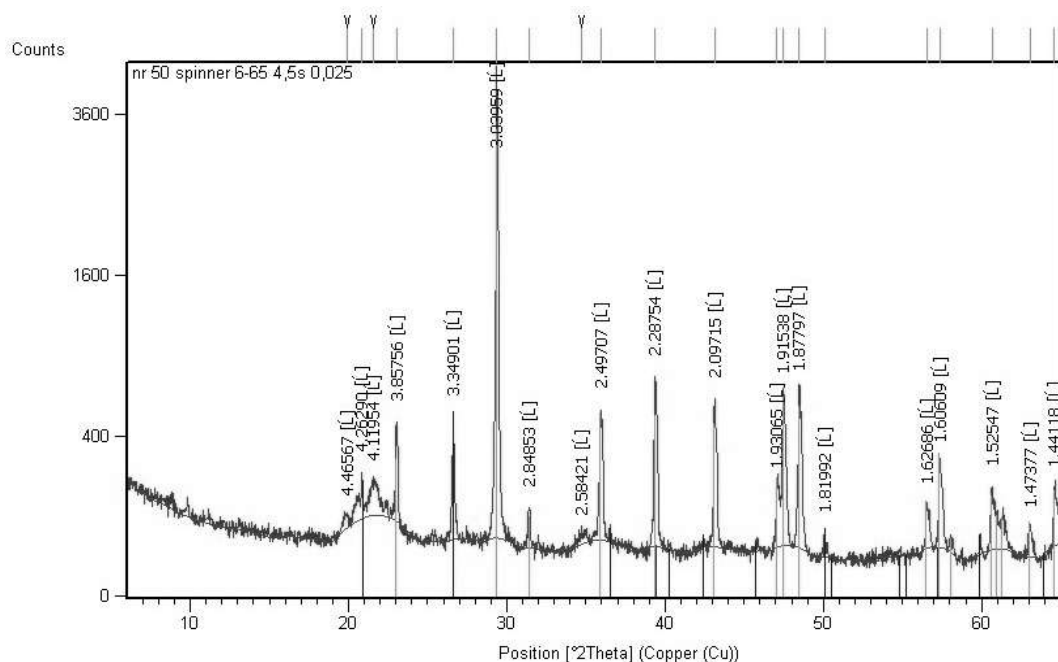


Fig. 11. Diffractogram of hard material

These experiments were performed also using other raw materials that enabled obtaining similar materials tinged with green or red. Undoubtedly, this process was carried out in the hydrothermal conditions. The forms of construction materials (brick, tiles) were obtained by casting from a slurry or plastic moulding. These fittings gained technically enough strength after complete cooling and evaporation. Full strength and durability were obtained after longer maturation. Among found construction materials (brick, tiles), medium hard materials dominate, thus from the phase of biogenic calcite amorphization. The extension of the process, or increase of parameters (e.g. pressure) resulted in obtaining harder materials, however, subject to crack destruction, which could be observed in the material from the bottom part of retort. The process itself was most likely performed in an open tub, thus in the conditions of normal pressure. Nevertheless, it is not excluded that the process was conducted in a closed autoclave (e.g. copper or lead). This can be explained by the continuation of archeological research in this area and more thorough material studies.

Alchemic search for petrification approach of writing chalk in 13th century in Cholm resulted from ideological needs, the aim of implementation of white construction elements of sacral and residential buildings at the lack of these materials due to political and economical possibilities of the investor, Daniel Romanowich.

The model for green and white buildings created here before the fire in 1256 as well as the attempts to recreate them, was the implementation of co-called Pisan School from the 12th century but in other architectural forms (Fig. 12, 13).

Inspiration for the search could be the appearance of white Chinese porcelain on European market, as well as the achievements of west European alchemy coming to Cholm.

The applied hydrothermal technology of chalk processing with the addition of horsetail, enabled transformation of this soft rock into the material similar to massive limestone and silicified marbles.

It has not been explained yet whether Daniel managed to develop the production of these artificial stones to the scale sufficient to open only the Church of St. John Chrysostom, however, without a doubt, this experiment is a pioneer in processes of silicate autoclave which are considerably more recent technologically.



Fig. 12. Baptistarium in Pistoia. Main entrance with green and white stone decoration. Photo Lorenzo Lovato

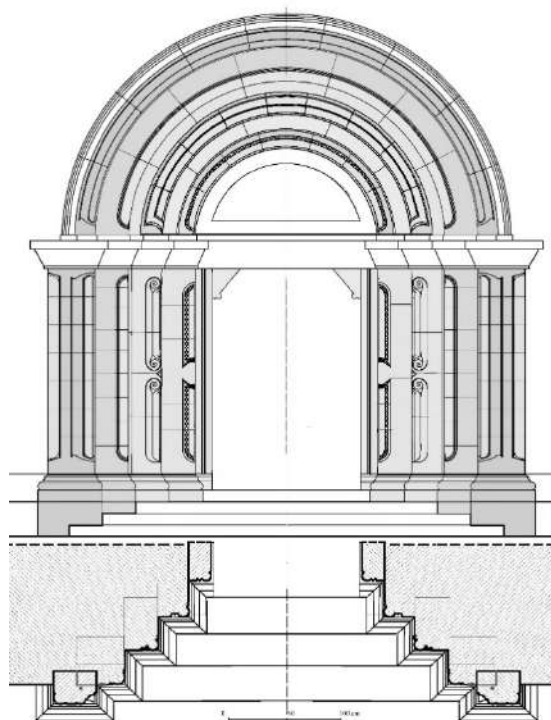


Fig. 13. Hypothetical reconstruction of main portal of St. John's Church of the king Daniel's residence in Cholm. Author M. Bevz

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АРХІТЕКТУРНІ ДЕТАЛІ ТА МАТЕРІАЛИ БУДІВЕЛЬ РЕЗИДЕНЦІЇ XIII ст. КОРОЛЯ ДАНИЛА РОМАНОВИЧА У ХОЛМІ

Анотація. У статті проаналізовано будівельні матеріали та архітектурні деталі, отримані під час археологічних розкопок на Високій Гірці в Холмі (сьогодні Хелм, Польща), в районі комплексу резиденції короля Данила Романовича з 13 століття. Домінують тесані блоки з каменю глауконітиту та вапняку.

Глауконітовий камінь у великій кількості знайдено в розкопах. Він слугував будівельним матеріалом для стін у формі тесаних блоків. Такі блоки можна поділити на дві групи: 1 – блоки у формі паралелепіпеда обтесані та шліфовані з усіх сторін; 2 – блоки у формі, наближеній до паралелепіпеда, які тесано та шліфовано лише з лицевої сторони; а решта сторін мають ламану поверхню та груботесану. Особливістю є те, що ці блоки часто використовувалися повторно у пізніших будівлях.

Глауконітовий камінь зустрічаємо також у формі архітектурних деталей з різьбленими елементами. У результаті археологічних досліджень виявлено сьогодні близько 50 таких деталей. Частина з них (близько 20 деталей) належить до так званої колекції П.Покришкіна – з розкопів виконаних у 1911–12 роках у південній частині гірки. Решта деталей виявлені розкопками останніх 8 років.

Усі ці архітектурні деталі можемо поділити на кілька груп: 1). Найчисельніша група – це профільовані наріжні блоки з півваликом (їх налічуємо 8 та ще 5 – у розкопах Покришкіна); 2). Інша група – це профільовані наріжні блоки з четвертною викружкою, півваликом та вертикальними тягами (1 блок та ще 3 таких блоки у колекції Покришкіна); 3). Криволінійні профільовані блоки з четвертною викружкою, яких знайдено три; вони були частиною архівольта арки перспективного portalу.

Аналіз архітектурних форм цих деталей дає змогу зробити висновки про їхню приналежність до таких частин будівель замку: перспективного portalу, обрамлення вікон та дверей, карнизи, колони, капітелі та ін.

Штучний камінь виступає у вигляді цегли та глазурованої плитки, а також значних безформних мас застиглої камяної тіста, що вказують на залишки процесу виготовлення. Матеріали штучні – білі, зелені та різнобарвні. Вони доповнюють застосовані тут галицькі алебастри та зелений глауконіт із Холма. Була проведена експертиза білих матеріалів. Їх діагностували за допомогою мікроскопа SEM та рентгенографії. Крім того, був проведений хімічний аналіз мікроструктури за допомогою мікроскопа SEM з модулем EDS. Проведена експертиза показала, що матеріали, про які йдеться, виготовлялися за іншими технологіями, ніж керамічні, але подібні до тих, що використовуються для виготовлення силікатних матеріалів у наш час. Як сировину використовували крейду та біогенний кремнезем, отриманий із хвоща. Процедура скам'яніння проводилася в гідротермальних умовах. У результаті був отриманий матеріал, структурно схожий на мрамур. Успішне виготовлення штучних матеріалів, уможливило реалізацію ідейних структур, побудованих під явним впливом стилю Тосканської школи 13 століття.

Ключові слова: натуральний камінь, штучний камінь, крейда, будівництво резиденції, Холм (Хелм), 13 століття.

Adrian O. Mandzy

THE 1649 BATTLEFIELD OF ZBORIV: IDENTIFICATION OF PLACE AND PLANNING RECONSTRUCTION

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Abstract. In 2001, dr. A. Mandzy, working with scholars in both Poland and Ukraine, initiated the Cossack Battlefield Commission to explore and study Cossack battlefields. The battle field near Zboriv 1649 was chosen as the object of survey. Much like previous excavations at the Berestechko Battlefield, the Zboriv project made heavy use of historical records, cartographic evidence and archaeological fields testing methods. Beginning in 2002, the group of researches, working under promotion dr. Mandzy in conjunction with the I. Kryp'iakevych Institute of Ukrainian Studies and Department of Architecture and Conservation of Lviv Polytechnic University, the regional power of preservation of historical and cultural monuments for the Ternopil Oblast, began a joint survey, the purpose of which was identifying any possible remaining cultural resources associated with the military events of 1649. Material of this survey was the basis for hypothetical planning reconstruction of 1649 field fortifications lines.

Key words: town of Zboriv, battlefield, Cossack and Polish Army, 17th century, hypothetical reconstruction, field fortification.

Introduction

The Battle of Zboriv is one of the major events in Ukrainian and Polish history. Following two days of bitter fighting, the battle came to an end with the signing of the Treaty of Zboriv. This Treaty recognized the *de facto* autonomy of three Ukrainian provinces and established an independent Ukrainian Cossack principality.

Analysis of publications about Zboriv battle

Initial reaction to the treaty was positive from both the Commonwealth and the Cossacks. The royal chancellery of Commonwealth prepared an official account about a glorious expedition and a felicitous peace that was published in newspapers throughout Europe (Teodor Mats'kiv, 1985) Galaktion, the Macedonian metropolitan, who claimed to have had a meeting with the Cossack leader, also wrote of a great Cossack victory, where the king "submitted and made obeisance" (Akty otnosiashchiesia k istorii Iuzhnoi i Zapadnoi Rossii, 1861). According to Lukash Klymovsky, a doctor in the Cossack camp, the king had been sorely beset at Zboriv and wrote to Khmelnytskij to make peace. The hetman obeyed him on the condition that there be Cossack towns as far as the Slutch River and Starokonstantyniv and as far as Bar and the Dnister River. According to the *L'viv Chronicle*, the king himself asked for peace and promised the Cossacks rights and privileges (*volnosti*). (Akty otnosiashchiesia k istorii Iuzhnoi i Zapadnoi Rossii, 1861).

In the years that followed, both sides continued to be interpreted the Treaty as a major victory. In 1663, for example, Pierre Chevalier wrote that the withdrawal of Khmelnytskij and the Khan from Zboriv greatly pleased the king, who escaped from such danger so cheaply. (Baraboj, A. Z., Bevzo O. A., eds., P'ier Sheval'e (Pierre Chevalier), 1993) The *Litopys Samovydtisia* states that the Zboriv agreement was a positive development for the Cossacks. According to this source, the monarchy was besieged without any hope of rescue and was only saved by the grace of Khmelnytskij, who did not want to send a Christian king into Islamic captivity (Dzyra, 1971). A little more than a half-century after the signing of the Treaty of Zboriv, the Cossack hetman Philip Orlyk wrote that since 1649, Ukraine was recognized as a principality by all of Europe (Orlyk, 1958).

This idea continues to be expressed in the late eighteenth/early nineteenth century work, *Istoria Rusiv*. (Konyskogo, 1846) Written by a nobleman under the influence of the Enlightenment and the ideal that each nation has the right to follow its particular destiny, the published manuscript is a political tract, the focus of which is the 1648 revolt. The Treaty of Zboriv is described in detail and seven major points of the treaty are listed. Following the signing of the treaty, according to the *Istoria Rysov*, Khmelnytskij disbursed his army and traveled to Kiev where, with great pomp and ceremony, he celebrated his victory.

In the light of nineteenth century romantic and populist movements, new interpretations developed about the Zboriv Treaty. Unlike earlier works, which were written by members of the elite and the descendants of the Cossack officer corp, this generation of scholars saw itself as part of the local indigenous population. Much like other intellectuals in 19th century Europe, they developed a fascination with the *narod*, or nation of people. As such, they rejected the *status quo* and its emphasis on the victories of dynastic rulers. This group of intellectuals and social activists sought to critically examine how historical events influenced all of the social and economic classes, especially the effects on the poor and the workers. Khmelnytskij now would be judged on how well his actions helped the people, and not in his ability in establishing a Cossack state.

Perhaps the first scholar to look at the events from this new school of thought was Mykola Kostomarov. Kostomarov rejected the perception of Khmelnytskij as national liberator and focused on the misery the wars had on the Ukrainian people. As to the importance of the Treaty of Zboriv in the establishment of the Cossack *hetmantate*, Kostomarov simply states that the Zboriv Treaty was twenty years too late to satisfy the needs of the Rus' nation (Kostomarov, 1990). That such a treaty would have been acceptable to Kostomarov earlier indicates that the text of the treaty itself was not at fault, but only that by 1649 the circumstances had changed to where it was unacceptable.

Other nineteenth century historians developed Kostomarov's ideas further. Volodymyr Antonovych saw the Treaty as another of Khmelnytskij's errors which brought with it great injury to the Ukrainian people (Antonovych, 1885). A few years later, one of Antonovych's students, Mykhailo Hrushevsky saw the Zboriv Treaty as not just an error of judgment, but as a betrayal of the Cossack hetman by his Tatar ally. In a chapter entitled "The Zboriv agreement and its hopelessness", Hrushevsky points out that it was the Khan who accepted the Polish proposal for a peaceful resolution to the ongoing hostilities. After accepting payment, the Khan told Khmelnytskij that if he did not make peace with the Commonwealth, then the Khan would join with the Poles and turn against the Cossacks. As part of the agreement, the Tatars could collect slaves on their return home. According to this interpretation, however, the taking of Ukrainians into Tatar captivity was not the only dark stains of the Treaty. According to Hrushevsky, the Zboriv Agreement severely truncated Cossack territory and those excluded from the register had to return to their former subject status. "For the broad masses, the results of the uprising were immediately struck out; all their efforts and sacrifices all their blood and suffering were turning out to have been in vain" (Antonovych, 1885).

Another contemporary of Hrushevsky, Iavornyts'kyj also points out the failings of the Treaty. Iavornyts'kyj devotes little attention to Khmelnytskij in this three volume history of the Cossacks, but noted that shortly after the signing of the Zboriv Treaty all of the Ukrainian masses were disappointed with the Cossack leader. As a result of this disappointment, according to Iavornyts'kyj, an unnamed Cossack titled himself as the Hetman of Ukraine and began to recruit Zaporizhian Cossacks to his side (Antonovych, 1885). Thus, for this group of scholars of the late nineteenth and early twentieth century, Zboriv failed because it did not protect the entire Ukrainian nation.

Not all published works, however, followed this trend. Mykola Arkas's illustrated 1908 popular *History of Ukraine-Rus* paints a very different account (Antonovych, 1885). Written for the masses, this account reflects the world view of Tzarist Black Sea naval officer (and later administrator) who's family could trace their roots to the Cossack officer class. According to this work, Khmelnytskij personally brought an end to the fighting after completely destroying all that stood in his way. To highlight the degree of victory achieved at Zboriv, Arkas included an illustration entitled "Bohdan Khmelnytskij after the Battle of Zboriv". This print shows Khmelnytskij mounted heroically on a large black stallion. The hetman is flanked by mounted Cossacks and cheering peasants, while below his feet are discarded Polish arms.

Throughout the nineteenth century, as Polish patriots tried to restore the Kingdom of Poland, popular histories focused on past military triumphs and losses. Of all the published works, Henryk Sienkiewicz's 1884 historical novel *With Fire and Sword* was the most important in establishing a Polish stereotype for the events of 1649. While the romantic protraits of heroic Poles and evil Cossacks are of limited academic value, the novel was critical in perpetuating Polish national identity. The work remains mandatory reading in Polish schools and is one of the most popular works of Polish literature. As the novel and its many film adaptations continue to influence the Polish subconscious, the climatic interpretations of the heroic Siege of Zbarazh and the signing of the Treaty of Zboriv with the Cossacks can periodically be recognized in Polish popular culture. Yet for all the novel's fictional liberties, the novel ends the story of the rebellion where most Ukrainian historians had previously recognized the beginning of the Cossack state – that of the 1649 Treaty of Zboriv.

The Polish historian Ludwik Kubala deals with the Siege of Zbarazh, the Battle of Zboriv and the Treaty in a historical-popular work. According to Kubala, the Treaty was hard on Khmelnytskij, as both the 40,000 Cossack register and his title of hetman were of no importance to an individual who already had power and authority (Kubala, 1909). In other general military studies, such as by Tadeusz Korzon, the Treaty was considered to be beneficial to the Commonwealth, as it allowed the Tatars to take slaves on their return home in place of unpaid taxes. The Cossacks, in turn, were satisfied with the raising of the Cossack register to 40,000 and the granting of the title Hetman and Elder of Chehern to their leader. (Korzon, 1912).

In the years following the First World War, new interpretations of the Zboriv Treaty emerged. Ukrainian Marxist historians, such as Mykhailo Pokrovsky and Matvij Iavorsky, viewed the Treaty of Zboriv along class lines. (Iavorsky, 1928), (Pokrovsky, 1933). According to this anti-Russian imperialist Marxist interpretation, Zboriv, along with the Bila Tserkva Accord, provided the Cossack elite with a way of controlling the masses. Non-Marxist historians, such as Viacheslav Lypynsky argued that the events at Zboriv were the first steps in reestablishing the Ukrainian Cossack state (Lypynsky, 1920). George Vernadsky wrote that the Zboriv Treaty was a "major achievement for the conservative core of the *starshyna*" and "it created an autonomous Cossack state within the framework of the kingdom of Poland" (Vernadsky, 1941). Others, such as Stepan Tomashivsky, challenged some of the basic principles of the negotiations that lead up to the signing of the Zboriv Treaty. Tomashivsky pointed out that the king's decision to open negotiations with the hetman was an admission of Poland's defeat (Tomashivsky, 1913). The fact that the Polish state later tried to hide this detail lends support to argument that the Commonwealth was politically overwhelmed.

Perhaps the most detailed account of the battle comes from the Polish historian Ludwig Fraś. Making use of predominantly published sources, Fraś's study contains the Polish order of battle, including the types of troops involved, the names of their commanders and their role in the engagement. Unlike many scholars, however, Fraś does not discuss the Treaty in any detail in this study. Rather, the author claims that after two days of fighting, the battle could have gone either way, depending on the whim of the Tatar Khan. In a separate study published the same year, however, Fraś states that the Khan forced Khmelnytskij to sign a treaty because it looked like the Battle at Zboriv was turning into a long, protracted siege, just like at Zbarazh (Fraś, 1932).

In the 1920s, Ivan Krypiakievych conducted an on-site study of the Zboriv battlefield and later published five separate accounts about the events of 1649.¹ Initially, Krypiakievych noted that the treaty did not provide

¹ His most detailed description appeared in *Zhyttia i Znannia*, no. 10-11, L'viv, 1929, while a later account published in the *Litopys Chervonoï Kalyny*, no. 10, L'viv, 1931, includes two maps, one which showed the disposition of forces at the time of the initial ambush, and second illustrated the attacks of the second day. These maps have often been republished and continue to be used by Polish and Ukrainian scholars to illustrate how the battle transpired.

Ukrainians with everything that the Ukrainian nation desired, but that it did provide Ukraine with its own army and a base from which an independent Ukrainian state could emerge. A few years later, when writing the Cossack section in the *Istoria Ukrains'koho Vijska*, Kryp'iakevych interpreted the Treaty of Zboriv as providing the legal bases for the Cossack state (*pravni osnovy kozats'kij derzhavi*). Later works, published during the height of Stalin's hold on academia, downplayed the statebuilding achievements. In Krypiakevych's biography of the Cossack leader, the author focused on the betrayal of Khmelnytskij by his Tatar allies and the anti-cossack role played by the Ukrainian nobleman Adam Kysil in the actual treaty negotiations. (Kryp'iakevych, 1990).

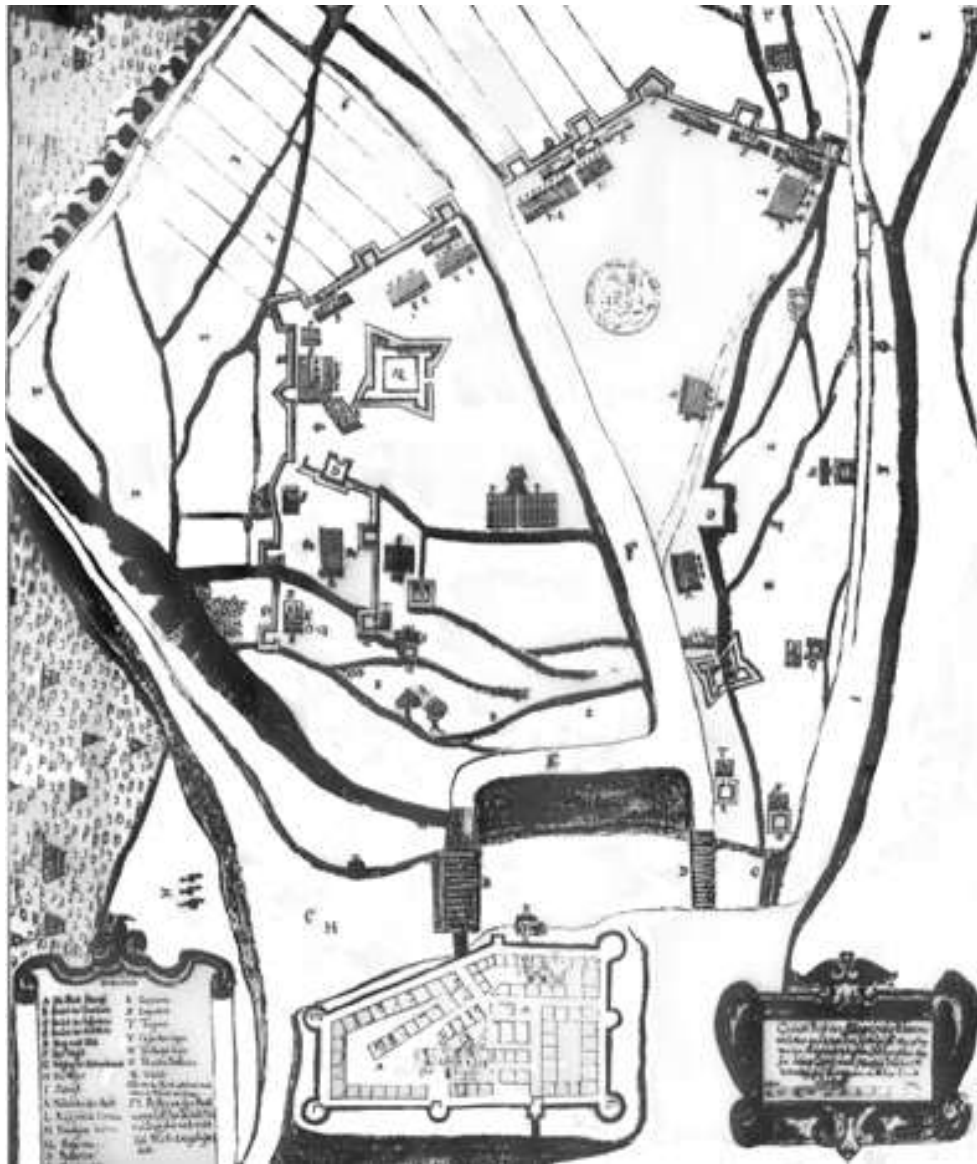


Fig. 2. 1649 Map of Zboriv, from Alexandrowicz

During and after the Second World War, political pressure to provide a pro-Russian Ukrainian hero resulted in exultation of Bohdan Khmelnytskij². Previous Marxist interpretations of a feudal lord who sold

² In October 1943, the Soviets created the Order of Bohdan Khmelnytsky, the only Soviet military order to include a non-Russian hero in Stalin's pantheon of "our great ancestors". As illustrated in a letter from Khrushchev to Stalin, Khmelnytsky was chosen not because he fought for Ukraine's liberation, but because of the union of Ukrainian and Russian peoples. Serhy Yekelchuk, "Stalinist Patriotism as Imperial Discourse: Reconciling the Ukrainian and Russian "Historic Pasts", 1939-45", *Kritika*, 3 (1): 51-80, winter 2002, p. 69.

out the peasants to Russian imperialism were swept aside and history texts glorified a military hero who had a single clear vision – reunification with Moscow. In this politically inspired view, Khmelnytskij single-mindedly pursued reunification over all other concerns; a dream which was fulfilled with the 1654 Pereiaslav Agreement (Kozachenko, 1954). Thus, in keeping with what John Basarab refers to as the 1654 thesis, it was with the signing of the Pereiaslav Agreement that the Ukrainians and the Russians began a successful struggle that culminated with the overthrow of the capitalist class and the establishment of the Soviet Union (Basarab, 1982). In this interpretation, the Pereiaslav Agreement serves as the cornerstone of the Soviet national myth.

Not surprising, the Soviet state apparatus sponsored countless public activities and academic publications on the three-hundred-year anniversary of the Pereiaslav Agreement. Given the importance of Pereiaslav for the Soviet identity, all other treaties and alliances were interpreted as merely temporary arrangements on the way to reunification. Although authors previously acknowledged the conclusion of the Cossack uprising with the establishment of the Cossack Principality in 1649, the now rechristened “War of National Liberation», reached its natural conclusion five years later at Pereiaslav. In this Soviet national myth, all other alliances and treaties were irrelevant and Treaty of Zboriv was but a stepping-stone to the goal of reunification.

While the vast majority of Soviet scholars downplayed the Treaty of Zboriv, some scholars outside the Soviet sphere of influence attempted to develop their own interpretations. Teodor Mats’kiv’s article on the treatment of the Zboriv Agreement in contemporary German and English sources states that in the face of the overwhelming enemy the Poles opened negotiations with the Khan in order to bring him to their side (Mats’kiv, 1985). According to Mats’kiv, the Khan agreed to the crown’s overtures because the Muscovite Cossacks attacked Tatar lands and the Khan did not want a strong Cossack state. Mats’kiv goes on to discuss problems with existing copies of the Treaty and points out that in an unmodified text of the Treaty which was published in Germany, the Cossacks of Kiev, Chyniv, Vinnytsia and all of Ukraine are to be free. Rather than going on to explore the implications of this agreement, Mats’kiv fell back on the nineteenth century tradition and states that Zboriv “did not reflect the actual achievements of the Cossack army and the great expectations of the Ukrainian national masses who stepped under the banner of Khmelnytskij in the fight for freedom” (Teodor Mats’kiv, 1985). Although Mats’kiv recognizes that the Treaty was important in the history of Polish Ukrainian relations, the focus of his argument shifts in defending the fact that Ukraine was a protectorate of Poland. He concludes his article with a discussion of how common protectorates were in the seventeenth century and quotes a German dissertation that paints Khmelnytskij as a *de facto* sovereign ruler. Rather than quoting from a contemporary primary source, which recognizes the achievement of Cossack autonomy, Mats’kiv curiously relies on a German study that appeared in the early years of the Nazi regime to make his argument for the establishment of Ukrainian Cossack state.

Other western scholars writing during the Cold War looked at the Treaty of Zboriv from either the initial historical interpretation that focused on recognition of autonomy (as argued by Orlyk, Arkas and Lypinsky) or from the *narod* school of thought (best summarized by Hrushevskij). George Gajecy argues that the Cossack state was created in 1648, but that it was only after the Treaty of Zboriv that the Polish Diet recognized the Cossack territory as an autonomous unit of the Polish-Lithuanian Commonwealth (Gajecy, 1978). Frank Sysyn noted that although the articles of the Zboriv Treaty did not include all the Cossack demands, they represented an undeniable triumph for the Cossacks and that the 40,000 man Cossack army ensured Khmelnytskij as an almost independent ruler of Ukraine (Sysyn, 1985). Others, such as Orest Subtelny, focus their attention on Hrushevsky’s argument of a Tatar betrayal (Subtelny, 1988).

In Soviet Ukraine, the 1654 thesis remained the cornerstone of all research connected with the seventeenth century. Though Mykhailo Braichevsky questioned the validity of the 1654 thesis in the late 1960s, the Treaty of Pereiaslav continues to draw the attention of scholars and politicians into the first decade of the twenty-first century (Braichevsky, 1972). The three hundred and fifty year anniversary of the 1648 rebellion drew little notice, but more than ten years after independence, Ukrainian President

Leonid Kuchma announced national celebrations to mark the Pereiaslav Accord. Many Ukrainians were offended with this planned celebration and President Kuchma drew the ire of scholars throughout the world.

In independent Ukraine, historians looking at the Battle and Treaty of Zboriv often seek ways to balance the achievement of recognition of autonomy with the criticisms presented by the *narod* school of thought by drawing attention to the nuances of the negotiations. Sveshnikov's interprets the Treaty as a result of Crimean Tatar betrayal and thus any achievements brought by the Treaty were irrelevant, since the nation was not freed from oppression by the nobility and the Catholic Church (Sveshnikov, 1993). According to Shevchenko, who wrote the introduction to the 1995 edition of the 1649 Cossack Register, the khan wanted to continue the war in Ukraine, so that he could collect slaves and receive payments from the crown (Shevchenko, 1995). Shevchenko also noted that the resulting Cossack Register confirmed Cossack rights in that they did not fall under the jurisdiction of the *starost*, *namisnykiv* and the nobility. Cossacks not listed in the register, however, must submit to the will of the king's representatives and their masters (Shevchenko, 1995). According to the *Ukrainian Cossacks, a Small Encyclopedia*, the Khan wanted to avoid the complete destruction of Poland, because he did not want to see Ukraine become a strong, independent Orthodox state³. The encyclopedia also states that Khmelnytskij was forced to accept unfavorable terms for Ukraine which did not reflect the achievements of the Cossack army nor the wider hopes of the national Ukrainian masses⁴. According to Valerij Smolij and Valerij Stepankov, Khmelnytskij was forced into signing the Treaty, but his requests to the king foresaw recognition of a Ukrainian state within the boundaries set by the document (Smolij, V., Stepankov, V., 203). Natalia Iakovenko noted that the Poles began discussions with the Tatars without Khmelnyts'kij's participation and that the 40.000 Cossack register was requested by the khan's vizar (Yakowenko, 2006).

With the end of the Cold War, Polish scholars began to look at the Cossack Wars. In the 1990s, popular accounts multiplied as Poles and Ukrainians began to discuss their shared and often misunderstood heritage. While older academic works were republished, perhaps the most important publication was the printing of two historical maps from 1649 (Alexandrowicz, 1995). These two maps, one of the Siege of Zbarazh and the other of the Battle of Zboriv were first listed in the 1976 catalogue of maps held in the National Library in Berlin greatest, but their first publication was delayed until 1995.

The map of Zboriv is rather detailed and shows the disposition of troops (Fig. 1) (Alexandrowicz, 1995). The earthen defenses are illustrated rather vividly, as is the position of the Cossack gun battery, and a less detailed plan of the town of Zboriv itself is also included. The map, according to Alexandrowicz, is about 1:3000, but is rather vague in regards to the local topography. The location of both the Cossack and Tatar camps are though to be rather schematic and the rivers are shown in only approximate locations. As the map was drawn during the battle, some inaccuracies of scale were inevitable, but the disposition of enemy forces are not though to be in scale with the Polish defense line.

Perhaps the most interesting post-Soviet interpretation of these events comes from a military historian, Ivan Storozhenko, who provides a somewhat different understanding of the Treaty. According to Storozhenko, it was Khmelnytskij who initiated the diplomatic talks with the king and used the khan as his intermediary (Storozhenko, 1996). As a rebel, and most likely not even a recognized member of the nobility, Khmelnytskij could not negotiate directly with his monarch. As Khmelnytskij did not want the destruction of the Commonwealth, he needed a political resolution to the ongoing conflict. By negotiating a treaty, he was able to achieve outside recognition of his authority and begin to bring stability and order into his domain.

While Storozhenko clearly addresses the issue of the Treaty from the state building school of thought (he quotes Lypyns'kyj in his text), he begins to contradict himself at the end of the chapter.

³ "The Battle of Zboriv 1649", *Ukrainian Cossacks, a Small Encyclopedia*, Zaporizhzhia State University, Geneva, Kiev, 2002, p 170.

⁴ "The Treaty of Zboriv 1649", *Ukrainian Cossacks, a Small Encyclopedia*, Zaporizhzhia State University, Geneva, Kiev, 2002, p 171.

According to Storozhenko, Cossack victory could still be achieved after the initial attack, but once the Polish forces constructed earthen field fortification, military success would require “significant effort” (Storozhenko, 1996). A possible explanation for the failure of the Cossack infantry was their delayed arrival from Oserna (14 kilometers away according to Storozhenko). While the distance from Oserna is less than ten kilometers, the main point of criticism is Storozhenko’s thesis itself. If Khmelnytskij sought a political resolution of the conflict, then he had no need to seek a military solution. Success on the battlefield, as achieved in 1648, did little to bring a consolidation of Cossack power. Further military actions, however, would most likely lead to the capture or even death of the monarch, neither which would allow Khmelnytskij to attain a political resolution that would be confirmed by all levels of the Polish government. Only by signing a treaty could Khmelnytskij become the legally recognized ruler of Ukraine.

Methodology of studies and presentation of main results

In spite of the significant scholarly attention the events at Zboriv have received, a number of questions remain unanswered. In pursuit of a better understanding of the Battle and the Treaty of Zboriv, in 2002 the author organized a group of Ukrainian, Polish and American students and scholars for the purpose of undertaking a battlefield survey project⁵. Since the primary documentary record is fragmentary at best and it is unlikely that new literary sources will be uncovered in the near future, the author applied a holistic multi-disciplinary approach, one that makes use of archaeological, historical, topographical and cartographic evidence. The results from the 2002 field season, along with data collected in 2004 and 2006, have sown the seeds of yet another possible interpretation of the events of 1649 (Fig. 2).

While interest in former fields of conflict has a long and complex history, before the 1980s no method existed for scholars to look at entire battlefields. Previously, historians often included maps of an engagement, but at times they bore little resemblance to the local topography. Archaeologists focused their energies to the excavation of particular features, such as campgrounds, siege lines, hospitals and burials, but lacked a way of dealing with the entire battlefield⁶. At times, however, particularly rich mass burials have been excavated, such as at the graves from the 1361 Battle of Wisby and the 1651 Battle of Berestechko (Thordeman, B., Noörlund P. and Bo E., 1939) (Sveshnikov, 1993). In most cases, however, the dead were stripped of all material goods before being buried.

Archaeologists who relied on traditional testing methods of digging in depth rarely have succeeded in identifying resources related to military engagements. Using traditional archaeological field methods at the American Civil War First Manassas (Bull Run) battlefield, for example, “only one artifact was found by shovel testing, while several hundred were found using metal detectors” (Babits, 2001). Not surprisingly, when in the mid-1990s, a group of young archaeologists employed traditional testing methods at the Zboriv battlefield, they failed to find any material from the seventeenth century battle⁷.

Following a fire at the Little Big Horn National Battlefield, archaeologists Doug Scott and Richard Fox began a program to look at the entire field of conflict (Scott, Douglas D., Richard A. Fox, Jr., 1987) (Scott, D. D., R. A. Fox, Jr., M. A. Connor and D. Harmon, 1989). To do so, they used metal detectors to locate artifacts and global positioning satellites or more commonly known as GPS, to plot the locations of the recovered artifacts. This data, coupled with extensive primary historical research and topographic data, provided scholars with a means of exploring battlefields.

⁵ This research program was made possible by a Fulbright-Hays Faculty Research Fellowship and through the support of Morehead State University.

⁶ First the territory of a battlefield, especially a post-medieval battlefield, can be a quite large, and secondly, artifacts are generally not distributed in depth.

⁷ World War One artifacts from these excavations are on display at the local museum in Zboriv.

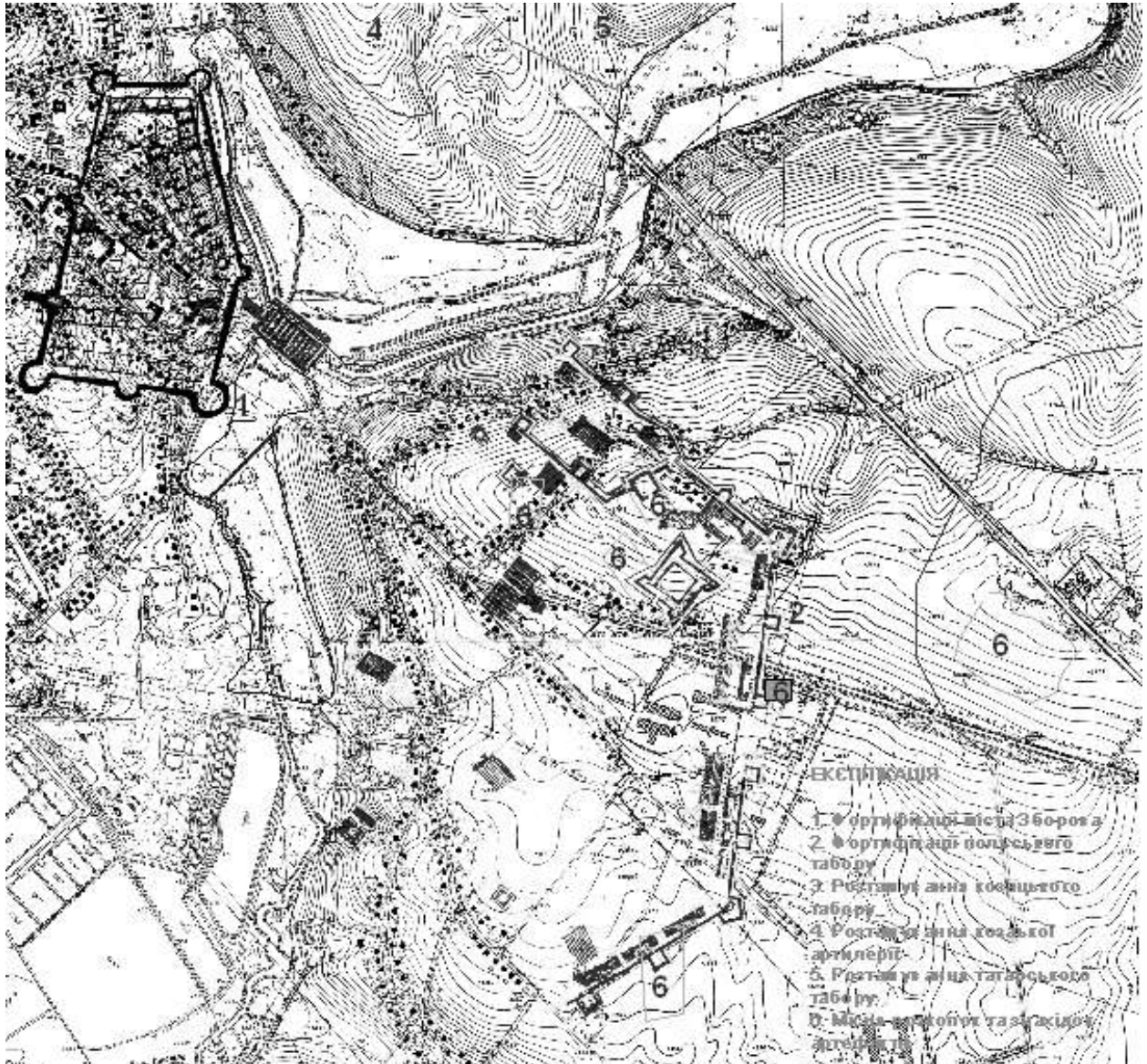


Fig. 2. Composite Battlefield Map



Fig. 3. Examples of 17th century ammunition

Building on the success of the Little Bighorn project, scholars followed the methodology outlined by Scott and began using metal detectors to survey other battlefields. By plotting the distribution of artifacts along a several square mile X and Y grid, it became possible to identify patterns across great distances.

Superimposing this grid on contemporary and historic maps further allowed correlation with primary descriptions of the battle and the local topography. The resulting dataset provided scholars with a much more accurate view of how the course of a battle developed and how troops reacted under fire. Other scholars also contributed to the growing field of battlefield research. In determining whether individual musket balls were dropped or fired, Dan Sivilich developed a “firing fan” model that predicted from which possible direction and location the shot originated (Sivilich). Using a similar approach, William Lee identified the area of fired shot behind a concentration of dropped shot as the rounds that overshot their intended targets (Lees, 1994). The repeated success of this approach has spanned similar studies in other parts of the world (Babits, 2001).

In 2001, the author, working with scholars in both Poland and Ukraine, initiated the Cossack Battlefield Commission to explore and study Cossack battlefields⁸. Much like Svechnikov’s previous excavations at the Berestechko Battlefield, the Zboriv project made heavy use of historical records, cartographic evidence and archaeological fields testing methods. Beginning in 2002, the author, working in conjunction with the I. Kryp’iakevych Institute of Ukrainian Studies and Bohdan Strotsen, the regional director in charge of preservation of historical and cultural monuments for the Ternopil Oblast, began a joint survey, the purpose of which was identifying any possible remaining cultural resources associated with the military events of 1649 (Strotsen’, 2003). Using the recently published map drawn by a participant of the battle which illustrates the disposition of forces and the extended fieldworks, along with the maps made by Kryp’iakevych during his visit to Zboriv and topographic maps of the region, we identified areas though to have the potential in yielding materials related to the battle. This information, when used in parallel with the limited descriptions of the battle, suggested areas for testing. During the course of a walking survey of Zboriv to identify areas severely impacted by modern development, discussions with area residents confirmed some of our reservations of how the 1649 battlefield was impacted by the trenches of First World War.

In 2002, our initial survey uncovered a significant amount of material. A wide variety of artifacts, many which date to the seventeenth century, were recovered during the course of the survey⁹. However, since these areas have been in agriculture for centuries, our initial analysis was restricted to distinctly seventeenth century military artifacts, specifically lead balls and arrowheads (Fig. 3). When we plotted the distribution of the seventeenth century military ordinance along an X and Y grid, we identified a line of dropped and impacted balls.

When we examined this distribution of military artifacts and compare them with the local topography, we see that all of these items are found along the military crest of a small rise. Since the “choice of ground on which to fight and the exact deployment of troops in battalia were based on sound military principles”, it is clear that the topographic environment predetermined the establishment of the firing line in this particular location (Foard, 2001).

In addition to the recovered ordinance, we also examined artifacts such as buckles, buttons, melted pieces of lead, and quantities of hand wrought iron which may relate to military wagons or weapons. According to contemporary accounts and the recently discovered 1649 map, the crown forces built earthen fortifications to strengthen their battle lines. The recovery of so many metal hardware wagon parts found alongside of seventeenth century military ordinance suggests that the army added wagons to the defensive line. As so many of the objects were found along the same area as the dropped ordinance, including of a Tatar arrowhead, the likelihood of direct correlation between these artifacts is quite high. Based on this information, we believed that we have discovered the eastern portion of a battle line at Zboriv in an area not yet subject to residential or industrial development.

⁸ For more information about the Commission and to view the results of the 2002 season, please go to the following web site: www.lviv.ua/cossacks

⁹ At Zboriv the most common artifacts recovered from the survey data are from later battles in this area. Shrapnel balls, rifle cartridges, bullets and artillery shell fragments from the First World War and the Polish-Ukrainian War of 1919 litter the 1649 battlefield.

In 2004, we returned to the area and conducted additional testing. Analysis of ammunition recovered from the two field seasons from this area of the battle line showed five discernable calibers and three types of ammunition in use. The first type of ammunition is represented by a large caliber round ball, between 16.6 and 17.0 mm in diameter and weighing between 19.5 grams and 25.3 grams, with the majority of the rounds weighing between 24 and 25 grams. Similar to the round balls mentioned above are those which are slightly heavier (28 grams) and have a diameter of 17.4 mm to 17.5 mm or between 0.68 to 0.69 of an inch. As balls of this type have only been recovered from the western edge of the battlefield, it is quite possible that these rounds were used by a particular military unit and are a variant of the slightly small round lead ball ammunition found throughout the battlefield. These are classic musket balls, which were used throughout the world from the seventeenth century up until the middle of the nineteenth century.

The second type of ammunition is a ball with an extended sprue intentionally left on the ball. These sprues are far more elaborate than a simple by-product of the casting process and the recovery of impacted balls with visible sprues indicates that these rounds were fired with the sprues still attached. Unlike eighteenth century cartridges, where both the ball and powder were inside a paper tube, makers of seventeenth century cartridges used the sprue to attach the ball to the paper tube. While such cartridges may have been in use by the mid-sixteenth century, in 1697, Saint Remy, a French scholar, “illustrated a cartridge with a ball attached by its sprue as the latest type (Remy, 1707) (Peterson, 1956). These are the most common type of seventeenth century small arms ordinance recovered at Zboriv and make up almost 50 percent of the assemblage.

Two sizes of extended sprue ammunition have been recovered at Zboriv. The most common rounds have a diameter between 12.6 and 13.3 mm, or in inches, between 0.49 and 0.52. These are the most common type of 17th century small arms ordinance recovered at Zboriv and make up almost 50 % of the assemblage. These balls are for a 50-caliber weapon. Less common are the slightly larger rounds that have a diameter of 14.1 to 14.7 mm, or 0.55 and 0.58 of an inch. Like the balls that average between 15.0 mm to 16.0 mm in diameter, too few of these balls have been encountered to allow for a significant discussion.

The final type of ammunition recovered from Zboriv is buckshot. These are small, cast rounds which also exhibit an extended sprue. Though not commonly recovered, all the buckshot has a diameter between 9.1 and 9.5 mm or between 0.36 and 0.37 of an inch. While it may be possible that the buckshot may not relate to the 1649 engagement, the degree of white oxide patina is indicative of old age.

What is the significance of this mathematical data? While it may be possible to recognize particular units based on the use of a particular weapon, the recovered ammunition challenges some of our understandings about the Cossacks. First of all, the standardization of ammunition into distinct sizes is a good indication that the firearms used by the troops were also standardized. Such a level of standardization is not uncommon amongst seventeenth century standing armies, but relatively unheard of in tribes or rebel armies. During the course of the American Revolution, one Pennsylvania Committee of Safety member complained about having to supply balls of seven different diameters to the American rebel army two years into the rebellion. (Neumann, 1967) Musket balls recovered at the 1782 Battle of Blue Licks indicated an even greater discrepancy in ammunition calibers, with ten distinct calibers being noted (Mandzy, 2008). Ammunition recovered from seventeenth century Native American sites appears in even greater variations. Bradley and Puype, who focused on the Onondaga and Seneca Iroquois respectively, argued that the absence of readily identifiable clustering patterns suggests a lack of any sort of ammunition standardization on Native American sites (Puype, 1985) (Bradley, 1987). This thesis is supported in part by the wide variety of calibers recovered from the 1686 wreck of the *Le Belle* (Bruseth, James E., Turner, Toni S., 2005).

Secondly, the presence of sprue ammunition indicates that the troops at Zboriv were using cartridges. The use of cartridges simplified the loading process and resulted in a faster rate of fire. Previously, musketeers relied upon bandoleers of pre-measured powder charges. Lord Orrery, a

seventeenth century military writer also noted that “bandoleers are often apt to take fire, especially if the matchlock musket be used.” (Peterson, *Arms and Armor in Colonial America 1526–1783*, 1956) Although mounted units used small metal cartridge boxes as early as the second half of the sixteenth century, the overwhelming majority of European infantry continue to rely upon bandoleers. Bandoleers were cheap to produce and continued to be found in European arsenals until the end of the century. Infantry cartridge boxes, however, were new and were in use in Ukraine as early as 1649¹⁰.

The recovered military ordinance challenges many of the commonly held assumptions of the Cossack armies of the mid-seventeenth century. Most scholars agree that the Cossack rebels wanted to create a new political system that would replace the religious, economic and culture elite in the southeastern territories of the Commonwealth, but few also note that the military innovations employed by Cossacks were just as revolutionary. Not only were the rebel armies under the direction of innovative leaders who had significant military talent and expertise in engineering, but the weapon systems used by the rebels were the most modern and technically developed in both Europe and Asia. Clearly, these armies may have looked rather raggedy, especially when compared to the silver and gold encrusted troops of the Commonwealth, but the Cossack army was a professional force equal to any on two continents.

In 2005, Bohdan Strotsyn carried out salvage excavations on the section of the Zboriv Battlefield impacted by the construction of a gasoline station (Strotsyn, 2007). As a result of our previous study of the battlefield, this area was believed to be sensitive for archaeological resources and it was postulated that the Polish defensive line ran through this location. Excavation for the underground storage tanks had begun previous to any sort of archaeological survey and it was doubtful that any information could be collected. After an extensive legal battle where the construction company was found to have disregarded the designation of the battlefield areas as an archaeological site, an agreement was reach and as part of the mitigation plan, Strotsyn excavated a series of trenches in the area where the gas station complex was to be built. In his excavation of the territory surrounding the already installed storage tanks, he found traces an earthen redoubt which was built as part of the 1649 defensive line.

In 2006, we returned to Zboriv to locate additional sections of the battlefield, many of which are now encroached by settlement¹¹. As the southern section of the 1649 defenses was the most impacted by the First World War, we directed our efforts along the northern and northeastern areas of the battlefield. Working on small parcels of land between existing structures, we were able to recover a number of seventeenth century artifacts which related to the battle. Among the musket balls and pottery shards recovered along the surface, the recovery of an octagonal pewter handle with traces of gold leaf within the Polish line illustrates how richly equipped the forces of the Commonwealth were at the time of the battle. The recovery of a similar style two-pronged fork from among the slain at the Berestechko Battlefield is thought to represent booty previously looted by Cossacks or peasants from the nobility (Sveshnikov, 1993).

In spite of the difficulties of working in developed areas, we were able to successfully conduct a historical-topographic survey of the battlefield. As a result of our six-week survey, located an independent redoubt within the Polish line, the area of the Cossack battery, the probable location of the Tatar camp, the church which the Cossacks captured and from which they fired on the entire Polish defensive line. From this information we were able to postulate the location of the Cossack camp.

The location of the Cossack camp was a great mystery and the predominant opinion was that it was located a few kilometers away from the Polish defense line. The initial discovery of a heavily worn large copper medallion, two possible seventeenth century coins and both fired and dropped musket balls

¹⁰ The leather and wood cartridge boxes were also recovered at the Berestechko battlefield. The Berestechko cartridge boxes are thought to be among the earliest known examples of infantry cartridge boxes used in Europe but it is more than likely that the Swedes first developed infantry cartridge boxes. Cartridge boxes quickly became popular and continued to be used until the end of the nineteenth century.

¹¹ This research was made possible by a Fulbright-Hays Faculty Research Fellowship and through the support of Morehead State University.

a little more than three hundred and fifty meters from the Polish line was initially confusing, but when we compared the location of these finds with the 1649 map, it was postulated that we had found the outer limits of Cossack camp. Additional testing in this area produced various personal and military artifacts, including a fragment of a horse bridle bit, a cast lead buckle, a button, an incised copper signet ring with two possible Cyrillic letters, two seventeenth century pottery sherds, and an unusual impacted musket ball which was fired into the perimeter of the Cossack camp.

The impacted musket ball in question was round and did not look unusual, but after washing, it was discovered that the ball was only partially made of lead. At the core of the ball was a stone pebble, part of which had chipped off when the bullet had hit a target. While the ballistic of such a musket ball, with its irregular center of gravity, was undoubtedly inferior to a spherical solid lead ball, its use suggests a temporary measure, most likely associated with a shortage of lead. Similar balls have been found in Ukraine near Pyliavtsi and have been associated with the 1648 battle fought in this location (Pohorilets, 2007). While the pebble lead jacketed balls from Pyliavtsi appear to be for a smaller caliber weapon, perhaps representing a unit of cavalry, the presence of extended sprue ordinance suggests that they relate to the events of 1648.

The recovery of such a pebble lead jacketed musket ball at Zboriv most likely indicates a shortage of lead, rather than any special type of experimental ammunition. With the destruction of army's supply wagons during the initial round of fighting, many supplies were undoubtedly lost. Once the Polish army became besieged at Zboriv, whatever resources were available were put into use. The documentary evidence provides numerous examples when besieged armies were forced to strip the lead from buildings, or to collect and reuse expended ammunition, and even use horseshoe nails as bullets (Sveshnikov, 1993). In 1662, for example, the Polish nobleman Ian Pasek writes that when faced with a lack of musket balls, his troops used small stones and horseshoe nails in place of bullets (Pasek, 1968). Thus, as the manufacture of lead jacketed stone pebble musket balls is a strong indication of a critical shortage of military supplies, the use of such stop-gap ammunition suggests significant logistical problems within the Polish camp.

The discovery of the Cossack camp, as well as the identification of the locations of the Cossack battery and the church from which the Cossacks fired into the Polish camp indicates of how critical the military situation had become for the monarchy. The location of the Cossack camp just over three hundred and fifty meters from the Polish line is not just a random distance, it is in fact, just a little beyond the maximum range of musket fire (Fuss, 2003). The placement of the Cossack camp served not only as a physiological barrier to the troops trapped inside the defensive line, but serve two practical purposes as well – to provide an observation point from which to safely watch the enemy and as a way of pinning the king's army in this location to prevent the possibility of any breakout. Similarly, the placement of the Cossack battery across the river allowed the rebels to fire at the enemy without any chance to being counteracted.

The information recovered from the three field seasons have forced us to ask more questions about the Battle and the Treaty. It is very clear that the Polish army was hemmed in from two sides and Storozhenko is quite correct in saying that it was only a matter of time before the Polish line was stormed or starved into submission. The recovery of the lead jacketed stone pebble musket ball which was fired into the direction of the Cossack camp underlines how critical the situation was for the monarchy. The ability to place an enemy into such position is a sterling example of Khmelnytskij's abilities as military commander.

The more pressing question is how to interpret the Treaty. Clearly, Khmelnytskij was duplicitous in his relations with existing monarchs and heads of state. Not only did he pledge his allegiance to the Tatar Khan, but he took up arms against his monarch. While numerous examples exist in Early Modern Europe where lords rebelled against their kings, Khmelnytskij was not a lord. It is for this very reason that Khmelnytskij stakes a claim to his nobility when he writes to the king during the course of the Zboriv negotiations (Hrushevskyj, 2002). Storozhenko is correct in saying that Khmelnytskij needed the Tatar khan to arbitrate in his negotiate with Jan Casimir, since no monarch (and all monarchs are chosen by

God) would belittle himself to negotiate with mere noble. And Khmelnytskij was only a Cossack. As a result of these negotiations, Khmelnytskij is no longer cursed by the monarchy, but rather was recognized as the legal administrator of the Ukrainian principality. Unlike the monarchy of the Commonwealth, which maintained no large standing army, Khmelnytskij's register of 40,000 Cossacks allows him to impose his will at any time.

Conclusions

As a result of the treaty, Khmelnytskij become the *de facto* autocrat of Ukraine. Internal attempts to challenge Khmelnytskij's authority were quickly settled and the perpetrators dealt with. Realizing that the structure of the *Hetmanate* would not allow him to establish a dynasty, Khmelnytskij turns his attention to Moldavia, where he strove to place his son on the throne. Failures in his Moldavian adventures came back to haunt the hetman, as he was defeated at Berestechko. Unable to regain the terms laid out in the Treaty of Zboriv with the Polish monarchy, Khmelnytskij tried to obtain a similar settlement with different rulers. While Hrushevsky pointed out the striking similarities between the Treaty of Zboriv and the 1654 Pereiaslav Accord, he offered no explanation (Hrushevskyj, 2002). If the Treaty of Zboriv did indeed serve as the model for the Pereiaslav Accord, then perhaps we need to reexamine the Treaty of Zboriv.

In reality, the Zboriv Treaty was a win for all three negotiators. The historian Myron Korduba is correct in seeing Zboriv as a Tatar victory, since the Tatars received both financial rewards and the right to collect slaves on their return to the Crimea (Basarb, 1982). In a similar manner, Khmelnytskij and the Cossack leadership also won, as they received autonomy from the Polish nobility, along with a host of other religious and secular concessions. The Polish monarchy and the armies trapped at Zboriv and Zbarazh also were victorious, in that each of the living got to go home. More importantly, the institution of the Commonwealth was able to survive and the nobility could continue to fight against the Swedes and the Turks. The king's dismissal of the noble militia after the signing of the Treaty and the ratification of the Zboriv Treaty by the Polish Diet in January 1650 suggests that the Crown viewed the Treaty as a positive development¹². The losers of the Treaty were those who had no voice at the negotiations – the rank and file peasants who had fought against the Commonwealth and the urban residence of Ukraine who within a few days were to be captured and sent into Tatar slavery. Yet in the mindset of the seventeenth century negotiators, the lower classes were expendable and not worthy of comment. The fate of Hrytsko Turchyniak, a resident of Zboriv who took part in the attacks on the Polish nobility during Khmelnytskij's time in Zboriv (*perebuvannia*), like so many of his peers who rose up against the existing *status quo*, remains unknown¹³.

Perhaps the final question about the entire campaign is how much of it was planned and how much resulted in luck. Unfortunately, the archaeological and topographic evidence does not address these issues and the historical evidence is too fragmentary to provide a definitive interpretation. Clearly, the ongoing siege of Zbarazh provided the ideal mechanism for drawing the king to the battlefield, and once relief force was assembled, Khmelnytskij was presented with the perfect opportunity to deal with the monarchy itself. The initial attack at Zboriv placed the monarchy on the defensive and removed the possibility of it conducting further offensive operations. While we have no evidence that the entire campaign was planned in expectation of such a development, our research shows that Khmelnytskij had clearly trapped the king and his army at Zboriv. Like General Vo Nguyen Giap at Dein Bien Phu a few centuries later, Khmelnytskij had no need of further attacking the enemy once he achieved his objective. Indeed, the death or capture of the monarch could have resulted in a general rising against the Cossacks, which in turn would have forced Khmelnytskij to turn to the more radical elements within

¹² Decree of Ian Casimir, Lviv City Archives, Tsentralnyj Derzhavnyj Istorychnyj Archiv Ukrainy, m. L'viv (TsDIAL), fond 9, op. 1, spr 399, str 292–293.

¹³ Terebovljans'kyj Hrods'kyj Sud, TsDIAL, fond 17, op. 1, spr. 131, str. 615–167.

his forces. Undoubtedly, such a turn of events would have placed an even greater reliance of the Cossacks on the Tatars. Clearly, it was not in the Cossack leader's interests to pursue such a potentially self-destructive policy.

One thing is clear, however. By the time the monarchy was trapped in Zboriv with no hope of escape, it was in Khmelnytskij's interest to force a negotiated settlement. Circumstance placed him in the perfect position of achieving recognition as ruler of Ukraine. Storozhenko is more than likely correct in stating that attacks on the earthen fortification would have required a greater military effort than the previous attacks on the enemy, but such statements are irrelevant. Khmelnytskij was too shrewd political to waste his opportunity of achieving recognition as *de facto* ruler of Ukraine by continuing his attacks.

A few years later, the wars resumed and new treaties were signed. Khmelnytskij's numerous attempts to reinstate the points of the Zboriv Treaty in all additional accords is undisputable evidence that the hetman did not simply settle for the Treaty of Zboriv. Clearly the Treaty of Zboriv was incapable of satisfying all members of society, but that was not its intent. The Cossack leadership was to be the new nobility and the Orthodox Church was to replace the Latins.

When comparing Khmelnytskij with other rebel leaders in world history, his creation of an autonomous Ukrainian Cossack principality was a remarkable achievement. Though people may lament that Khmelnytskij did not pursue a policy that included the interests of all economic classes, one cannot judge seventeenth century behavior by using nineteenth century values. While many in Europe rose up against their monarchs, Khmelnytskij attained that which many only dreamed of. Like the Czech General and Hussite leader John Žižka before him and Theodor Kosciuszko a hundred and fifty years later, that which he created did not last, but that in no way takes away from he accomplished. For that reason, and for that reason alone, Zboriv represents a watershed event in the history of Europe.

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ПОЛЕ БИТВИ 1649 РОКУ ПІД ЗБОРОВОМ: ІДЕНТИФІКАЦІЯ МІСЦЯ ТА ПЛАНУВАЛЬНА РЕКОНСТРУКЦІЯ

***Анотація.** У 2001 р. д-р А. Мандзій, працюючи з науковцями у Польщі, і в Україні, ініціював створення комісії для вивчення козацьких полів битв. Об'єктом для досліджень було вибрано поле битви під Зборовом 1649 р. Подібно до попередніх розкопок на полі бою в Берестечку, проєкт "Зборів" активно використовував аналіз історичних документів, картографічні дані та методи тестування археологічних полів. Починаючи з 2002 року, група дослідників, що працювали за керівництва д-ра Мандзія спільно з Інститутом українознавства імені І. Крип'якевича і кафедрою архітектури та консервації Львівської політехніки, регіональною владою зі збереження пам'яток історії та культури Тернопільської області, розпочали спільне дослідження, метою якого було: виявити можливі інші культурні ресурси, пов'язані з військовими подіями 1649 р. Дуже корисним було використання нещодавно опублікованої карти, учасника битви, яка ілюструє дислокацію сил. Було реалізовано польові дослідження, у зіставленні з аналізом карт, зокрема, картою битви історика І. Крип'якевича та топографічними картами регіону. Були визначені території безпосередніх подій битви, а також райони, що мають потенціал для отримання матеріалів, пов'язаних із битвою. Ця інформація допомогла визначити території для обстеження і тестування. Під час опитування мешканців Зборова з метою виявлення районів битви підтвердилися деякі застереження щодо існування на околиці міста траншеї з часу Першої світової війни. У 2002 році під час первинного інструментального дослідження було виявлено значну кількість матеріалів – найрізноманітніші артефакти, багато з яких датовані XVII століттям. Однак, оскільки ці райони протягом століть були в сільськогосподарському використанні, до аналізу бралися лише чіткі артефакти XVII ст., зокрема свинцеві кулі та наконечники стріл. Коли виконувалося картографування розподілу військових артефактів сімнадцятого століття по сітці X та Y, визначалися лінії опущених та уражених куль. Це був базовий матеріал для гіпотетичної реконструкції розпланування польових укріплень 1649 р.*

***Ключові слова:** місто Зборів, поле битви, козацька та польська армія, XVII століття, гіпотетична реконструкція.*

Yaroslav Taras

SCHOOLS OF FOLK TEMPLE BUILDING, TYPES AND GROUPS OF CARPATHIAN CHURCHES

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Abstract. The author has identified four schools of folk temple construction along the Carpathian region (viz. Boiko, Hutsul, Lemko and Transcarpathian ones). Within the borders of Boiko historio-ethnographical massif there have been 2 types and 3 groups of churches, 1 type and 1 group have been spread in Hutsul land, 8 types in Lemko area. 8 groups of temples have been known within the borders of Transcarpathian historio-geographical region. In the course of research-works a conclusion has been appeared that the greater number of architectural projects in design of churches were realized along the Lemko and the Transcarpatian areas as well as in contact zones between the lands of Boikos, Transcarpathins, Hutsuls and Bukovinians. One might easily distinguish characteristic wooden churches of Boiko and Hutsul territories owing to the most integral architectural and constructive features of temple buildings. A discovery has been proved that Carpathian Ukrainians' church wooden architecture, forms and symbols of which represent and save the highlanders' consciousness of all-Ukrainian unity as well as bright regional specificity belong to a circle of historic phenomena and the highest expression of folk traditional constructive culture.

Key words: Boiko region, Hutsul land, Lemko area, Transcarpathia, school of folk temple construction, wooden church, Carpathians.

Formulation of the problem

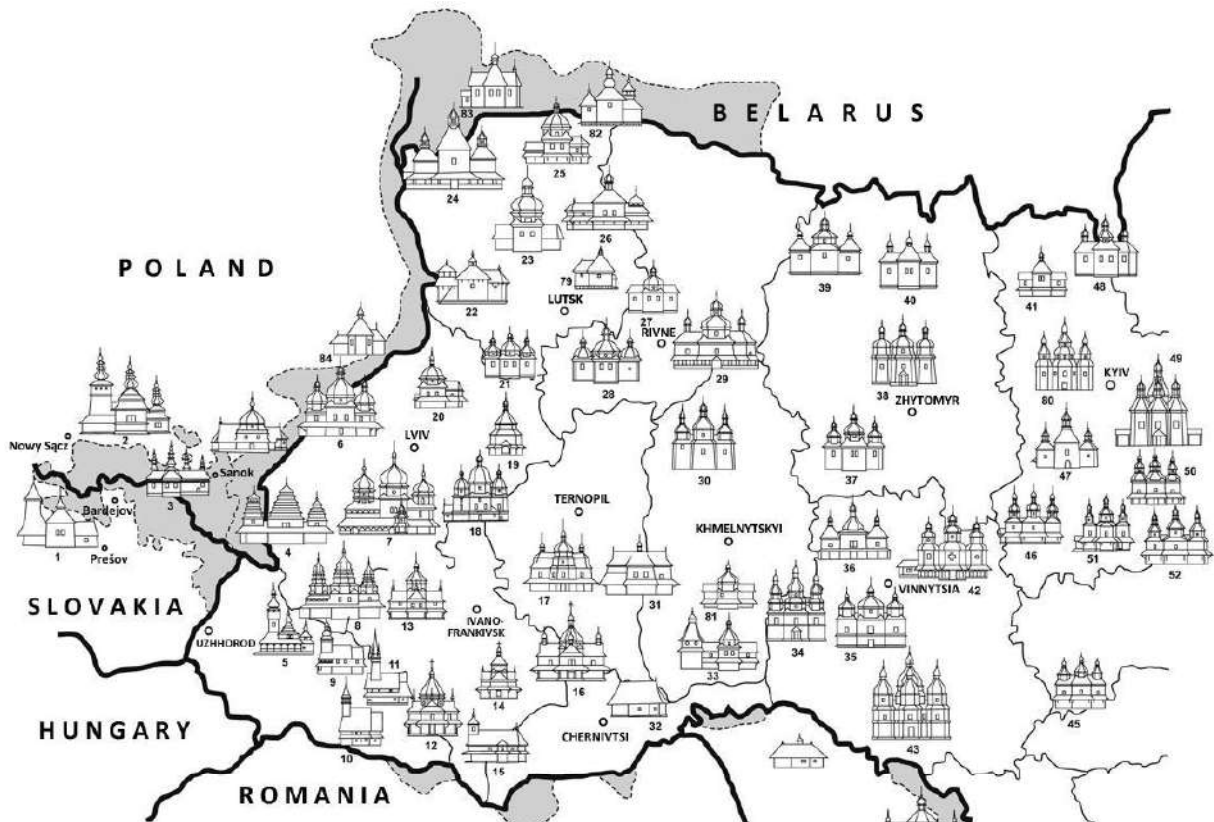
The Ukrainian wooden church architecture is a significant component of the traditional folk culture, in which the Ukrainian ethnos, through construction and artistic, aesthetic means has demonstrated and consolidated its spiritual values and high artistic talent for many centuries.

The study of folk temple building is extremely necessary for a deep knowledge of national traditions, building and art culture of people, finding its historical sources. It provides an opportunity to solve a number of issues related to the formation of ethnic environments and regional peculiarities. The original architectural and artistic tradition of Ukrainian highlanders (Hutsuls, Boykos, Lemkos) is the key to solving many issues of the genesis of sacred architecture of Ukrainians and neighboring nations. The Carpathians is a region of preservation of cultural and local archaic complexes, the most original wooden churches, which have no analogues in the construction art of other regions of Ukraine.

The presence of a large number of authentic churches allows not only to trace the traditional and local peculiarities of traditional construction of them, but also to identify the boundaries of the existence of the main types of churches, which are important both for the architectural and ethnographic zoning of Ukraine, and for the definition of schools of the folk temple construction.

Analysis of the research and publications

V. Shcherbakivsky, V. Sichinsky, V. Zalozetsky, P. Yurchenko, G. Logvin, I. Mohitich, V. Zavada and L. Pribega were studied and determined certain types of churches, schools of folk temple building (schools of folk temple architecture, schools of folk church construction). Volodymyr Sichynsky distinguishes the following types of churches in Ukraine: Boyko, Lemko, Hutsuls, Podilsky, Slobozhansky, Middle Dnieper (Sichinsky, 1956, pp. 101–109).



- 1 – ts. sv. Luky. Trochany. 1739 r.
- 2 – ts. sv. Koz'my i Dem'iana. Krampna. 1782 r.
- 3 – ts. Pokrovy Pr. Bohorodytsi. Koman'cha. 1805 r.
- 4 – ts. Rizdva Blahovischnennia Pr. Bohorodytsi. Yablouiv. 1838 r.
- 5 – ts. sv. Mykhajla. Shelestove. Poch. XVIII st. 1777 r.
- 6 – ts. sv. Paraskevyy. Krekhiv. 1724 r.
- 7 – ts. sv. Yura. Drohobych. Kin. XV – poch. XVI st.; XVII, XVIII
- 8 – ts. sv. Mykhajla. Kryvka. 1795 r.
- 9 – ts. Vvedennia Pr. Bohorodytsi. Torun'. 1809 r.
- 10 – ts. sv. Mykhajla (Verkhnia). Serednie Vodiane. XVIII st., 1428 r.
- 11 – ts. sv. Mykhajla. Krajnykove. 1668 r.
- 12 – ts. Preobrazhennia Hospodn'oho, Lazeschyna-Plytovatyi. 1780 r.
- 13 – ts. sv. Mykhajla. Slyvki. 1760 r.
- 14 – ts. Rizdva Pr. Bohorodytsi Vorokhta
- 15 – ts. sv. Mykhajla. Yasinia. 1836 r.
- 16 – ts. Blahovischnennia. Kolomyia. 1587 r.
- 17 – ts. Voznesinnia. Chortkiv na Vynhantsi. 1738 r.
- 18 – ts. Soboru Pr. Bohorodytsi. Batiatychi. 1778 r.
- 19 – ts. sv. Paraskevyy. Bus'k. XVIII st.
- 20 – ts. sv. Paraskevyy. Belz. XVII st.
- 21 – ts. sv. Mykhajla. Kniazhe. 1782 r.
- 22 – ts. sv. Dmytra. Hishyn. 1537 r.
- 23 – Sobor Blahovischnennia. Koval'. 1505 r.
- 24 – ts. Uspennia Pr. Bohorodytsi. Kachyn. 1599 r.
- 25 – ts. sv. Ilii. Kamin'-Kashyrs'kyj. 1700 r.
- 26 – ts. Rizdva Pr. Bohorodytsi. Vyderta. 1737 r.
- 27 – ts. sv. Yurii. Bronnyky. XVIII st.
- 28 – ts. sv. Yurii. Dubno na Surmychakh. 1709 r.
- 29 – ts. Pokrovy Pr. Bohorodytsi, Voloskivtsi. XVIII st.
- 30 – ts. sv. Mykhajla. Zin'kiv. 1769 r.
- 31 – ts. Uspennia Pr. Bohorodytsi. Chortkiv. XVII st.

- 32 – ts. Uspennia Pr. Bohorodytsi. Vperedisti Kalychanky, Chernivtsi. 1783 r.
- 33 – ts. Vozvyzhennia Chesnoho Khresta. Kamianets'-Podil's'kyj. XVIII st.
- 34 – ts. sv. Mykhajla. Chemerysy Volos'ki (Zhuravivka). 1765 r.
- 35 – ts. v Varvarivtsi. XVIII st.
- 36 – ts. sv. Yurii. Stari Khutory. 1726 r.
- 37 – ts. sv. Mykhajla. Pechaniuka. XVIII st.
- 38 – ts. Rizdva Pr. Bohorodytsi. Ryzhany. 1777 r.
- 39 – ts. Rizdva Pr. Bohorodytsi. Zhubrovychi. 1698 r.
- 40 – ts. sv. Trijtsi. Hladkovychi. XVII st.
- 41 – ts. Rizdva Pr. Bohorodytsi. Ladyzhychi. 1742 r.
- 42 – ts. sv. Mykhajla. Stara Vinnytsia. 1746 r.
- 43 – ts. Uspennia Pr. Bohorodytsi. Yaryshiv. 1768 r.
- 44 – ts. Voznesinnia Pr. Bohorodytsi, Khodoroutsy. Poch. XIX st.
- 45 – ts. sv. Trijtsi. Puhashivka. 1761 r.
- 46 – ts. Tr'okh Sviatykh. Pyschky. 1651 r.
- 47 – ts. sv. Mykhajla. Dorohynka. 1600 r.
- 48 – ts. sv. Yurii. Tovstyi Lis. 1760 r.
- 49 – ts. Rizdva Pr. Bohorodytsi. Khodoriv. 1768 r.
- 50 – ts. sv. Mykhajla. Chajky. XVIII st.
- 51 – ts. Rizdva Pr. Bohorodytsi. Antonivka. 1777 r.
- 52 – ts. Pokrovy Pr. Bohorodytsi. Sukhyj Yar. 1774 r.
- 53 – ts. Pokrovy Pr. Bohorodytsi. Pekariv. 1775 r.
- 54 – ts. sv. Mykhajla. Sen'kivtsi. XVII, XIX st.
- 55 – ts. Pokrovy Pr. Bohorodytsi. Syniavka. 1775 r.
- 56 – ts. sv. Trijtsi. Drabivtsi. XVIII st.
- 57 – ts. sv. Trijtsi. Korop. 1716 r.
- 58 – ts. Pokrovy Pr. Bohorodytsi. Mali Budky. 1791 r.
- 59 – ts. sv. Mykhajla. Koman'. 1781 r.
- 60 – ts. Pokrovy Pr. Bohorodytsi. Romny. 1764 r.
- 61 – ts. Pokrovy Pr. Bohorodytsi. Smile. 1800 r.
- 62 – ts. Preobrazhennia. Mezhyrich. 1760 r.

- 63 – ts. Pokrovy Pr. Bohorodytsi. Zin'kiv. 1759 r.
- 64 – Sobor Sv. Trijtsi. Novoselytsia (Novomoskovs'k). 1773-1781 rr.
- 65 – ts. Vvedennia Pr. Bohorodytsi. Artemivka. 1761 r.
- 66 – ts. Preobrazhennia. Oleshnia. 1780 r.
- 67 – ts. sv. Mykhajla. Korovyntsi. 1752 r.
- 68 – ts. sv. Trijtsi. Cherkas'kyj Byshtyn. 1751 r.
- 69 – ts. v Oleksandrivtsi (Bilia Khortytsi). XVIII st.
- 70 – ts. Uspennia Pr. Bohorodytsi. Voronivka. 1797 r.
- 71 – ts. Rizdva Pr. Bohorodytsi. Bereka. 1787 r.
- 72 – ts. sv. Mykhajla. Lyman. 1798 r.
- 73 – ts. sv. Mykhajla. Solonivka. 1789 r.

Gregorii Logvin, according to the natural and climatic conditions of Ukraine, identifies four major zones (Polissya, forest-steppe, steppe, mountain and foothill areas). There were schools of Volyn, Chernihiv, Podilsk, Pridneprovsk, Poltava, Slobozhansk, Southern, Bukovina, Hutsuls, Boykos, Lemkos, Galicians, Transcarpathians (Logvin, 1999, pp. 417–462).

P. Yurchenko notes the existence of schools of folk temple architecture in Galicia (Yurchenko, 1970, p.

74). According to P. Yurchenko, there are Boykivshchyna, Bukovyna, Volyn, Hutsulshchyna, Galicia, Transcarpathian, Dnieper, Podillya, Slobozhanshchyna, and Chernihiv regions (Yurchenko, 1970, pp. 81–157).

I. Mogitich was also engaged in the study of building schools of folk church building, schools of monumental construction of the Carpathians. On the basis of the study of artistic and technical means of the building of certain types of folk churches in the Ukrainian Carpathians, I. Mohitich discovered such building schools - Hutsuls, Boykos, and Lemkos (Mohitich, 1987, p. 206).

Prof. V. Brykovskii points out that the existing churches in the Carpathians are connected with three ethnographic groups (Lemkivshchyna, Boykivshchina, Hutsulshchina), which have their own types of churches in a certain territory, differing in their form of the tops, plans, technical solutions, architectural details (Brykowski, 1995, pp. 84–95).

Despite extensive material on architecture, there are no clear indications that determine affiliation of the churches to a particular school of folk temple construction.

The purpose of the article

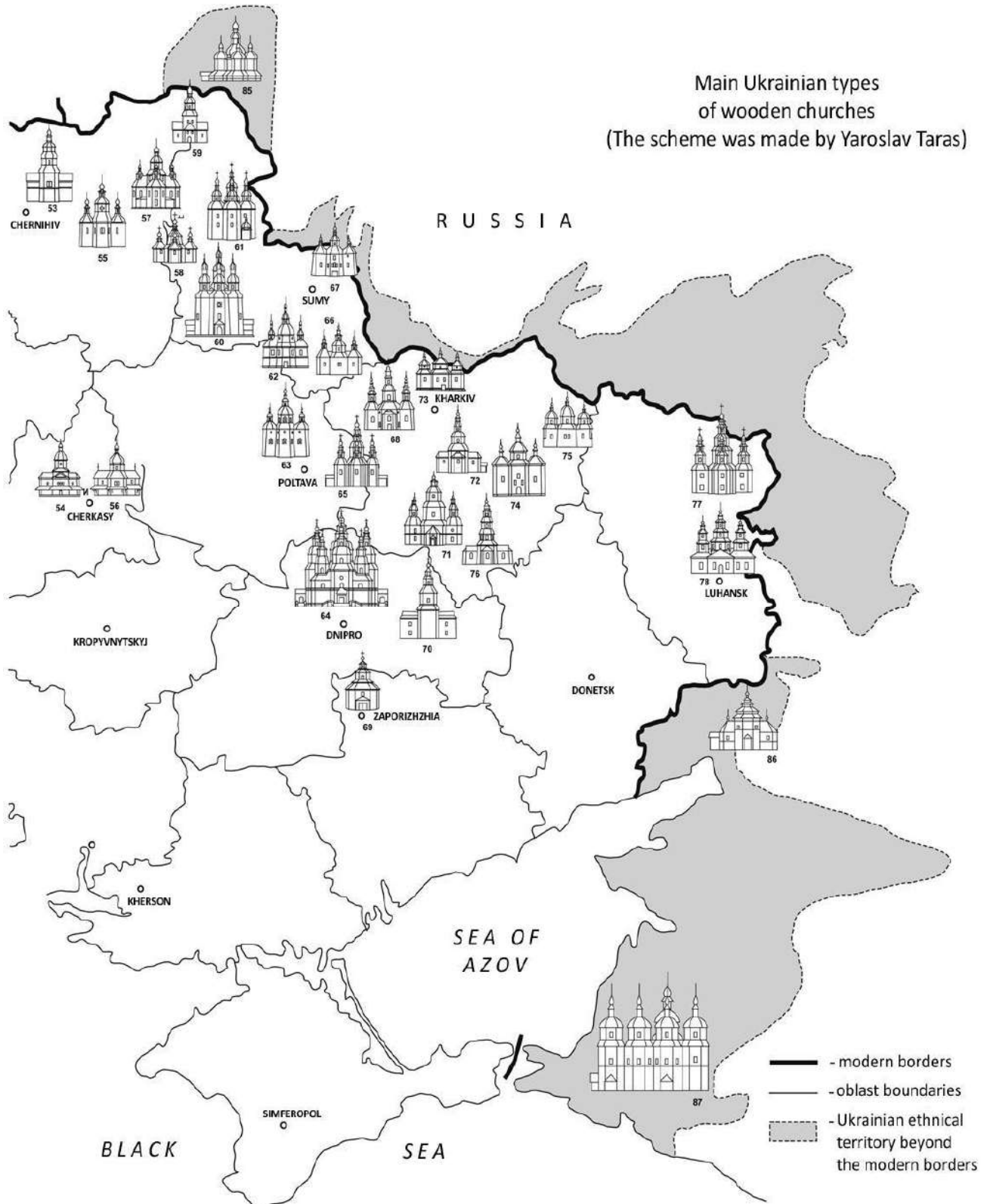
The purpose of the proposed article is to identify the features that have emerged in the architectural and constructive decisions of the wooden churches of Ukrainian Carpathians, on the basis of which it is possible to distinguish schools of folk temple construction, types and groups of churches.

The Presentation material

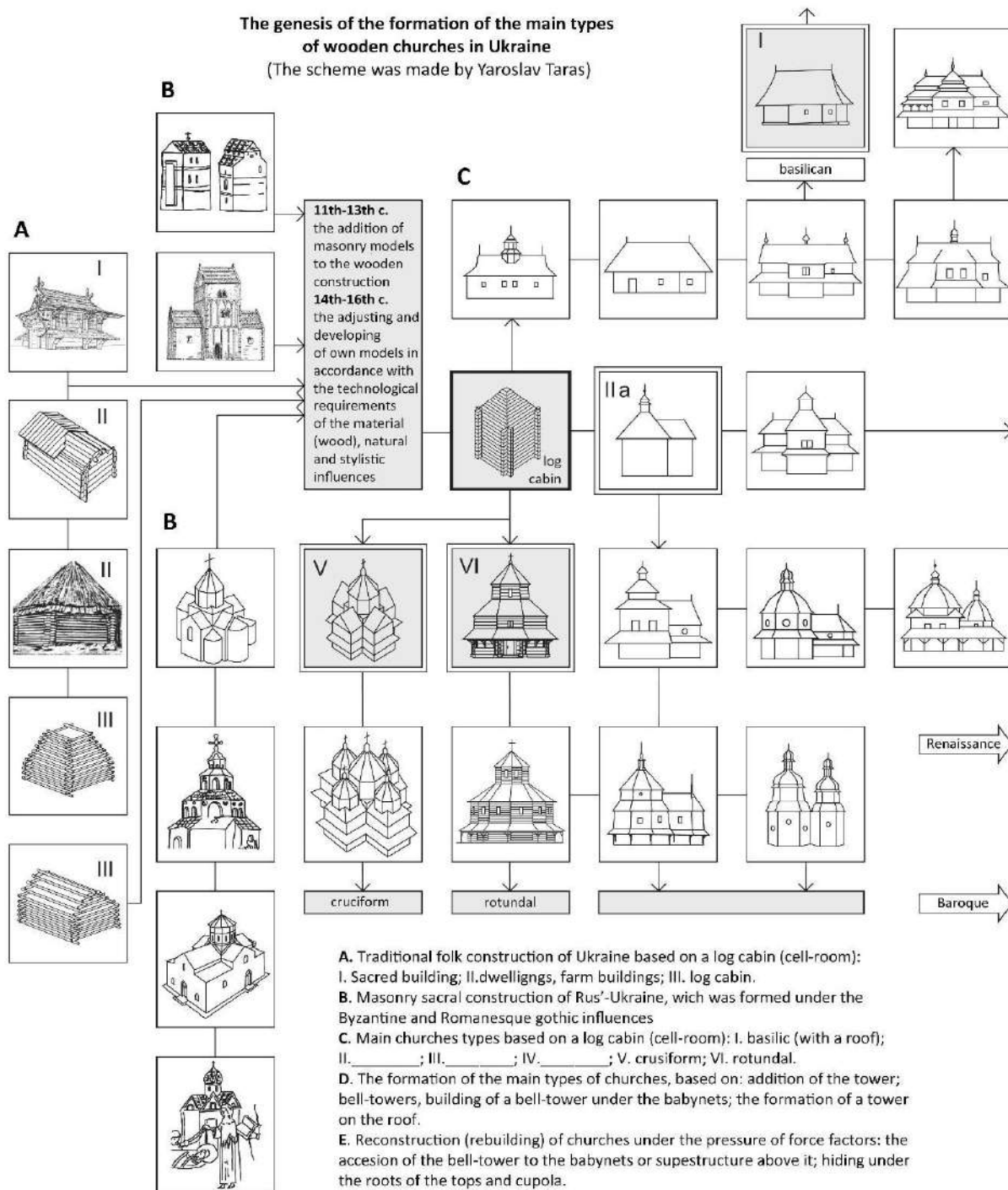
Researchers of the Ukrainian sacred wooden architecture recognized the existence of schools of folk temple construction (architecture) in the Carpathian region. Schools are created by acquiring specific features in construction. A folk tradition forms in the process of the construction of a temple, a house, household buildings. The delimitation (selection) of schools in folk construction, takes place on the basis of signs that have been formed in architectural and constructive decisions under the influence of historical, spiritual factors, religious beliefs, and have become indicators in the identification of the architecture of an ethno-national community, an ethnographic or ethnic group.

Ethnic identity of schools of folk temple construction takes place at the internal level of the formation of an ethnic group and is closely linked to material and spiritual culture. It has indicators that have been developed as a result of the centuries-old construction tradition in the building of a temple, a house, farm buildings.

Before taking up the characteristics of the schools of the people's temple building of the Ukrainian Carpathians, it is advisable to define the term itself. The school of folk temple building is a collection of historically established architectural areas of the construction of churches that are characteristics of certain areas and are identification indicators that determine the ethnographic and ethnic group, indicate the use of traditional techniques or the excellent means of architectural formation of space in a wood, is an architectural expression of religious ideals and the outlook of the people.



Geomorphological factors, natural and climatic conditions, external and internal influences affected the formation and distribution of volumetric-planning decisions of wooden churches of Ukrainian Carpathians (Taras, 2007, pp. 93–160). In the Carpathian region, such schools of folk temple building were identified – Boikos, Hutsuls, Lemkos, and in the historical-geographical region of Transcarpathia were separated types and groups of churches.

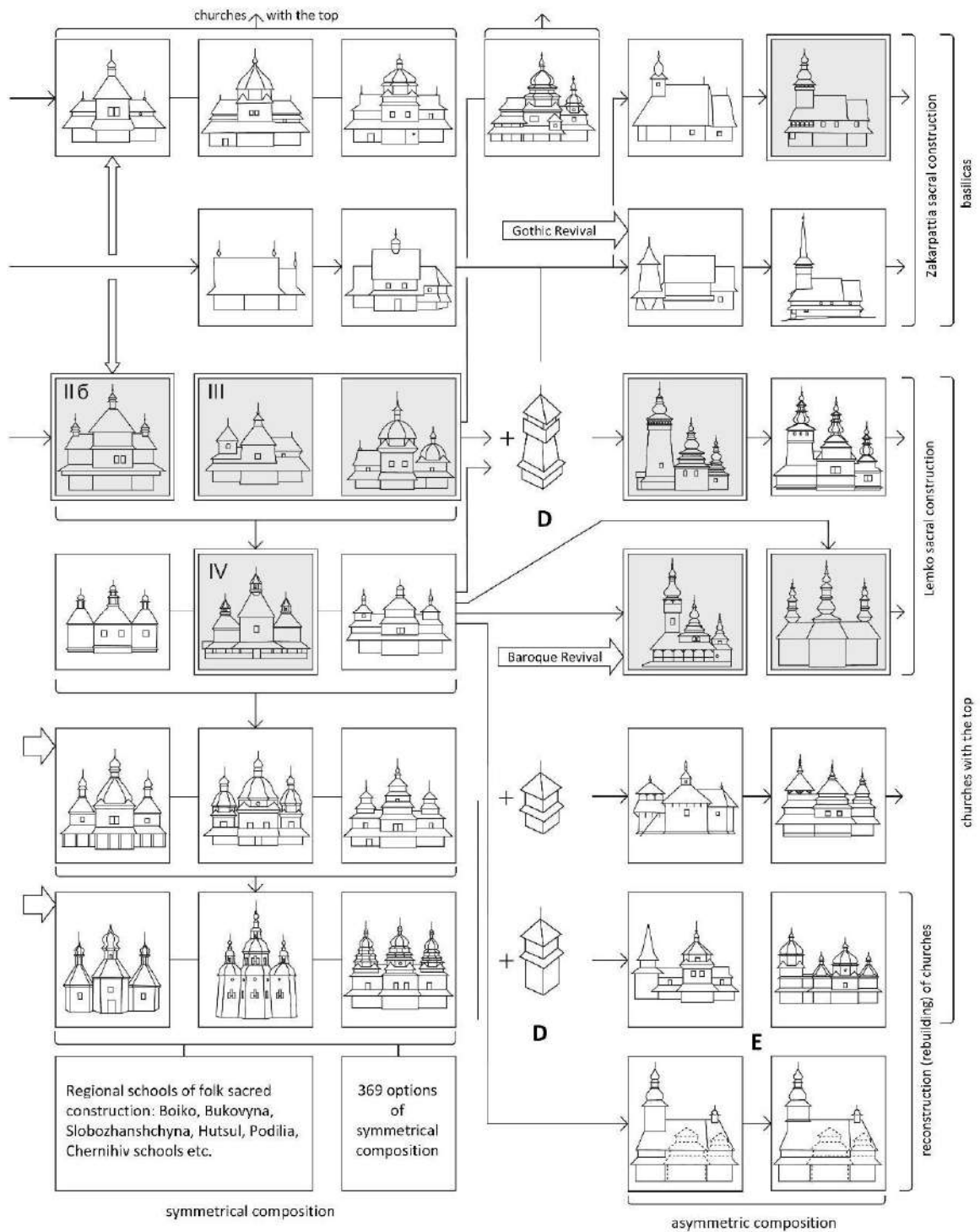


Boykos school of folk temple building

V. Scherbakivsky (Scherbakivsky, 1913, p. 5) was the first one, who described the churches that were in the ethnographic boundaries of the Boykivshchyna. In his opinion, Boykos church has eight common features with general-Ukrainian and six distinctions, which indicate that it is a separate type (Shcherbakivsky, 1913, pp. 5–6). V. Sichinsky, on the basis of field research of churches held in the Galician Boykivshchyna in the summer of 1923 and in the Subcarpathian Boykivshchyna in 1924–1925, divides them on the basis of the number of spaces for “simpler” and “more complicated” types (Sichinsky, 1926, p. 158–159).

In his later work, V. Sichinsky refers only to the churches located within the ethnographic group of the Boykivshchyna, indicating the specificity of the Boykos-type church and its archaic, significant preservation of original form (Sichinsky, 1956, pp. 102–104).

Defining Boykos type of churches is given by Y. Babiy. Of his definition “this type is already completed and authentic”, it “distinguishes itself in comparison with Hutsuls and Lemkos in the general-Ukrainian style with its extremely original forms and peculiar structure” (Babiy, 1939, p. 19). Boyko churches were also investigated by P. Yurchenko and G. Logvin. According to P. Yurchenko, “Boykos church of the eighteenth century with high towers comes from ancient timber block-house system that was in the sixteenth and seventeenth centuries distributed in Galicia and the northern Carpathians. It has survived in its original forms only in the mountains, where new buildings with multi-level high towers were created in the eighteenth century” (Yurchenko, 1968, pp. 57–58).



According to G. Logvin, “the temples of the Boyko school masters differ, first of all, in the composition of the plan, which is always formed by three square logs, the average of it is slightly larger, as well as the geometry of forms, which fully corresponds to the interior space [...] with plenty rooms (Logvin, 1999, pp. 453). Mohitich, characterizing the Boyko building school of folk church building, points out that for him “the characteristic fragmentation of one-, two-, and triple churches with multi-zaloms [that literally means a “fold”], it traces the gradual complication of the configuration and form of the top - from the simple cut-out pyramid to the high multi-tower (Mohitich, 1987, p. 231).

Polish professor R. Brykovskii defines the geography of the Boyko type of distribution, as well as gives an analysis and description of the main Boyko types (Brykowski, 1995, s. 89–92).

Based on our previous research, we will give the main characteristics of the Boyko school of folk temple construction:

- the architectural and constructive decision is made on the basis of the subordination of the general masses of the central composition, symmetry, harmonization and geometrization of forms, the fragmentation of one-, two- and three-layer churches with multiplication, complete correspondence between the interior and the exterior;
- the plan is always formed by three rectangular, close to squares, logs: the middle (nave) is slightly larger, the two sides (the babinets, the altar) are smaller;
- the presence of the increase, bells and galleries in the second layer around the western frontier;
- constructive means are always organically linked to the artistic expressiveness of the structure: the inclination of all the planes of the walls of the frame to the middle of the structure (the average log is smaller than the inclination of the walls of the altar and the babinets) was carried out to provide a structure of greater staticity, a greater height due to optical illusions and to facilitate the masses of the upper architectural forms;
- logs are covered by three high step-pyramidal tops, the average higher from the side, dominates over the whole structure, the two lateral tops are not quite symmetrical, have no exact church is different in a different combination of octagon-on-square and quadrangular in plan construction;
- in Transcarpathia, the tops of the babinets and nave can be of the same height; the upper top of the babinets will never be higher than the nave; it can serve as a bell tower;
- tops of the Boyko Churches are lower than the general-Ukrainian, “grow” mainly from three rectangular logs combined by roofs on brackets or pillars, have more zaloms;
- the functional rooms of the sacristy and “diakoniki” built at the same time as the church do not extend beyond the size of the central log; square, wings at the altar, wing-apses in the navas are within the limits of the roofs, and if the above are submerged, they are covered with separate roofs or baroque towers;
- the wooden walls are well protected from rain and moisture by dismembering the covering on horizontal layers with large drafts, the organization of the roofs that encircle the church, and the widespread encirclment on the western facade on the carved pillars with slopes in the form of arches;
- the sheathing of the walls to the roofs is carried out by a screw of a different patterns, which enriches the planes of the building;
- the entrance door in the babinets is always from the east (although there is a door from the south), the construction and ornamentation of the doors have the traces of the gothic;
- the floor at the altar is never higher than the floor in the nave;
- the iconostasis is always multi-layer, reaches the height of the first middle-floor hall;
- illumination of premises in the lower layer in the quadrangular in plan construction is carried out through small windows, that are absent in multi-level tops;
- the presence of a large number at the top at different levels of horizontal beams (cross beams, clips, scales);

Prehistoric multiplied in vertical dimension churches of the archaic type, formed by three square logs, the average of which is slightly larger, ends with pyramidal vertices with one, two zaloms (the church of St. Paraskeva, the city of Skole, the XVII century, St. Dmytro, with the v. of Mala Linina, 1742, Assumption of the Blessed Virgin Mary, Turka, 17th c.). They are located on the main communicative routes between the Carpathian and Transcarpathian regions.



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4

Church of Boykiv school of folk temple construction. An example of loss of the original form. An extract from collection of Shevchenko Scientific Society in Lviv. **1.** Church Pokrovy Pr.Bohorodytsi, Talamash XVII; Photo taken by V.Schebakivsky; **2.** Ch. Uspennia Pr.Bohorodytsi, Topil'nytsia (Horishnia), 1730; Photo taken by V.Schebakivsky; **3.** Ch. of snt.Nicholas in Tur'ye village, 1690; Photo taken by V.Schebakivsky in 1910; **4.** Ch. of snt.Nicholas. Photo taken by Yan Taras in 2011

At the highest level of Ukrainian sacred architecture are the following churches: Cathedral of the Blessed Virgin Mary, w. Matkiv, 1838 (middle upper with five octopus, babinets – four-pointers); v. Roztoka, 1862 (“the middle upper with five octagon-on-square towers, the babinets with four, and the altar with three”); v. Mohnate, mid. XIX century. (“The middle upper with four quadrilaterals and two octagons, lateral babinets with three quadruplets while all three peaks have octagonal towers”); St. Mikhail, v. Rosohach, 1882; The descent of Spirit, v. Vysotsko Lower, 1814 (“the middle upper and the Babynets with three quadruplets and three octagon-on square shape construction, presvetry with three quadruplets and two octagons”) (Dragan 1937, part 1, pp. 90, 92, part 2, figure 96, 98).

Boyko Sacral Architecture is truly a work of folk art, a relic of Ukrainian architecture. Here the original forms of the XVI–XVII centuries were preserved.

Hutsul School of Folk Temporary Construction (Taras, 2000, pp. 239–262; Taras, 1999, pp. 472–509). Most researchers denote cross-layout church that exist within and outside the historic and ethnographic region of Hutsulshchyna, as a creation of the Hutsul school of folk temple construction. At the same time, other types of churches present in this historical and ethnographic area are not taken into consideration.

The architectural and constructive characteristics of the churches are given by V. Sichinsky, P. Yurchenko, G. Logvin (Sichinsky, 1956, pp. 105–106; Yurchenko, 1970; Logvin, 1999, pp. 417–462).

In detail, I. Mohitich investigates the preserved cross-layout churches of Huzulshchyna, distinguishes according to the criterion of proportionality in constructing plan five basic types (Mohitich, 1987, pp. 207–215).

Prof. R. Brykovskii on the basis of ethnographic works by Y. Falkovsky defines the limits of distribution of Hutsul cross-layout churches: in the East they are limited by White Cheremosh River, in the West by Prut, in the North the boundary passes from Delyatyn through the Upper Bereziv, Yabluniv, Kosiv, and Kut. He believes that before Hutsulshchyna occupied the territory between Prut and Limnytsya, the Hutsul churches were located far in the Northwest outside the Svicha river, and eventually they were pushed out of this district by the Boyko church. In the North, the Hutsul churches go far beyond the ethnographic boundaries of Hutsulshchyna to the Kalush area, Kolomyia, and cross the border of the Prut River; they can be found in the outskirts of Tlumach, outside the Cheremosh River in the North-Eastern direction in the outskirts of Snyatin or Gorodenshchyna “(Brykowski, 1986). Over time, the Hutsul churches went deep into the Chornohora massif, through the pass to Transcarpathia (the Church of the Lord Lazeshchyna Plitovaty, 1780, the Church of the Ascension of the Lord, v. Yasinia, 1824) (Sirochman, 2000, pp. 609–611, 619–623).

The appearance of churches outside the historical and ethnographic boundaries of Hutsulshchyna – in Pokutta, Boykivshchyna, Transcarpathia – can not be linked only with the Hutsul school of folk temple construction. For example, churches between the Sukil and Limnitsa rivers (Sloboda Bolechivska, 1700, Lipa, 1720, Knyazivske, 1774, Tysiv, 1783, Vytvitsa, 1824, Tsenyava, 1745), Mohitych and R. Brykovskii belong to the Hutsul school, and G. Logvin to the Galician school (Mohitich, 1987, pp. 214–215; Logvin, 1957, p. 213). Ethnographers also count this territory to the Boykivshchyna (Boykivshchyna, 1983, p. 27; Huzulshchyna, 1987, p. 25).

There is reason to believe that this group of churches can not be attributed either to the Hutsul or Galician schools. It appeared in the area where the medieval monasteries were earlier (Kripyakevich, 1927, pp. 75–76), the churches were built there according to certain patterns. For example, the Church of Mezhygirske Monastery (Tselevich, 1886–1887; Mokłowski, 1914) was an example for Maniavskii Skete. Researchers associated the emergence of the cross-layout church with Armenian influences (Dragan, 1937, p. 59), their distribution – with the Maniavsky Skete, which was the center of the Orthodox Church of Galicia and Podillya, and many people came to it. They differ from those within the Hutsulshchyna, in particular, they have granular armors, except for the western ones, covered with a log frame like a closed vault; the middle upper is the center of the whole composition, the feature of which is the compactness of the volume (v. Sloboda Bolechivska, 1700; Tysiv, 1783, Synovidne Lower, 1803, Maniava-Nadvirna, 1681, Krekhovich, 1842, Puilo, 1778, Yasin Horyshnyi, 1756). In the same Hutsul churches, the armors are rectangular, have different proportions, are covered with roofs, flap ceiling.

It is expedient to define this group of churches as Bolechiv-Dolin-Periginsk. Its foundations were laid by monasteries based on the cross-layout churches that took place in Pokuttia and continued in Hutsulshchyna (Taras, 2003).

Within the historical and ethnographic region of Hutsulshchyna there are two more groups of churches, which researchers often overlook or refer to Transcarpathian or Bukovinian schools. In the South, there are three-partial churches with armor-conches (side-arms are rectangular, altars) and a low tower on the roof (Lazeshchyna, 1827, Chorna Tysa, 1836, Stebny, 1856, Kvasy, 1860 (1905), St. John the Baptist, Yasinia, 1926), in the west – three and one-and three-conches churches (Ust-Putila village, 1881) (Taras, 2006, p. 107). – 110, 164–167).

These are a few groups of churches that appeared in the nineteenth century on the edge of ethnographic regions. Taking into account the fact that the dominant type in the Hutsulshchyna are cross-layout churches recognized by the researchers as the works of local masters, we will mention the main features inherent in the Hutsul school of folk temple construction:

– the cross-layout plan is created by crossing two rectangles or by adding to the central square of the smaller rectangular ramen;

– the three-dimensional solution depends on the proportions of the lateral ramens, which can be of five types from the principles of construction to the central frontal square (Mohitich, 1987, pp. 207–216):

1) a plan in the form of an equilateral cross (the church of the village Vorokhta, The Nativity of the Virgin Mary, 1615, 1811, Lazeshchyna Plitovaty, 1780, Delyatyn village of 1620–1630, the village of Knyazhdvir, 1846, Dora village, the XVII century, now in the city of Yaremcha);

2) the plan is close to the cross with a slight reduction of lateral rectangular ramen (St. John the Most Gracious in Yaremche of the nineteenth century, Transfiguration of the Lord Church in the village of Rozhniv, 1841, the Transfiguration of the Lord in the village of Loev, in the eighteenth century, Strukovska church of the village. Yasin, 1824), with three parietal rames (St. Yakim's Church of Smodna village, XVIII century); 3) plan of the cross with short lateral armors (the church of the Annunciation of Kolomyia, 1587, St. Dmitry village of Kremintsi, in the eighteenth century, St. Anne village of Bystrets, 1872, St. Trinity village Mykulychyn, 1868); 4) a plan of the cross with a slight reduction of lateral rectangular ramen and an elongated rectangular babinets (the church of the Assumption of the Virgin Mary in Pistyn village, 1600, St. John, Zelena village, 1846), with crossed armors, and a rectangular babinets (Church of the Exaltation in Nadvirna, moved from Maniavsky Skete in 1681); 5) a plan of the cross with short lateral rectangular armors and an elongated babinets or altar (St. Paraskeva's Church, Kosmach village, 1718, Virgin Mary's village Kryvorivnia, 1818), with three faceted armors and a rectangular babinets (St. Vasil, Pidzakharychi village, 1876);

– the compositional diversity of churches is achieved at the expense of rectangular granular ramen of different proportions, unequally oriented to the axes, and the completion of the main volumes by one, three, five towers;

- the dominant axis is the east-west (the church of St. Pistyn, the first half of the eighteenth century, Maniava, 1681, Krivorivna, 1818, Tysmenytsia town, 1736);

- the rectangular base of the nave in most of the churches is visible from the outside, elevated to the level with the "horse's" roofs, serves as the basis for an octagonal neck, which is much narrower than the average log, the transition between the square base and the octagonal neck is carried out through visible outside of the Pentecostal;

- the towers of the five-domed churches are always located on the axes, the central one is higher than the other four, equal in height, in the three tower structures located on the longitudinal axis (east-west), the tower of the nave is higher than the towers of the altar, the babinets, and the last – equal with each other;

- logs on each cross are covered with a vault, less with a slippery slab, nave – with a tower; Roofs of lateral rectangular armors of a two-slope, many-sided – pentagonal;

- an octagonal neck is covered with a tent or tent with a slight intercession, which ends with a crown with a cross, placed on a small lamp;

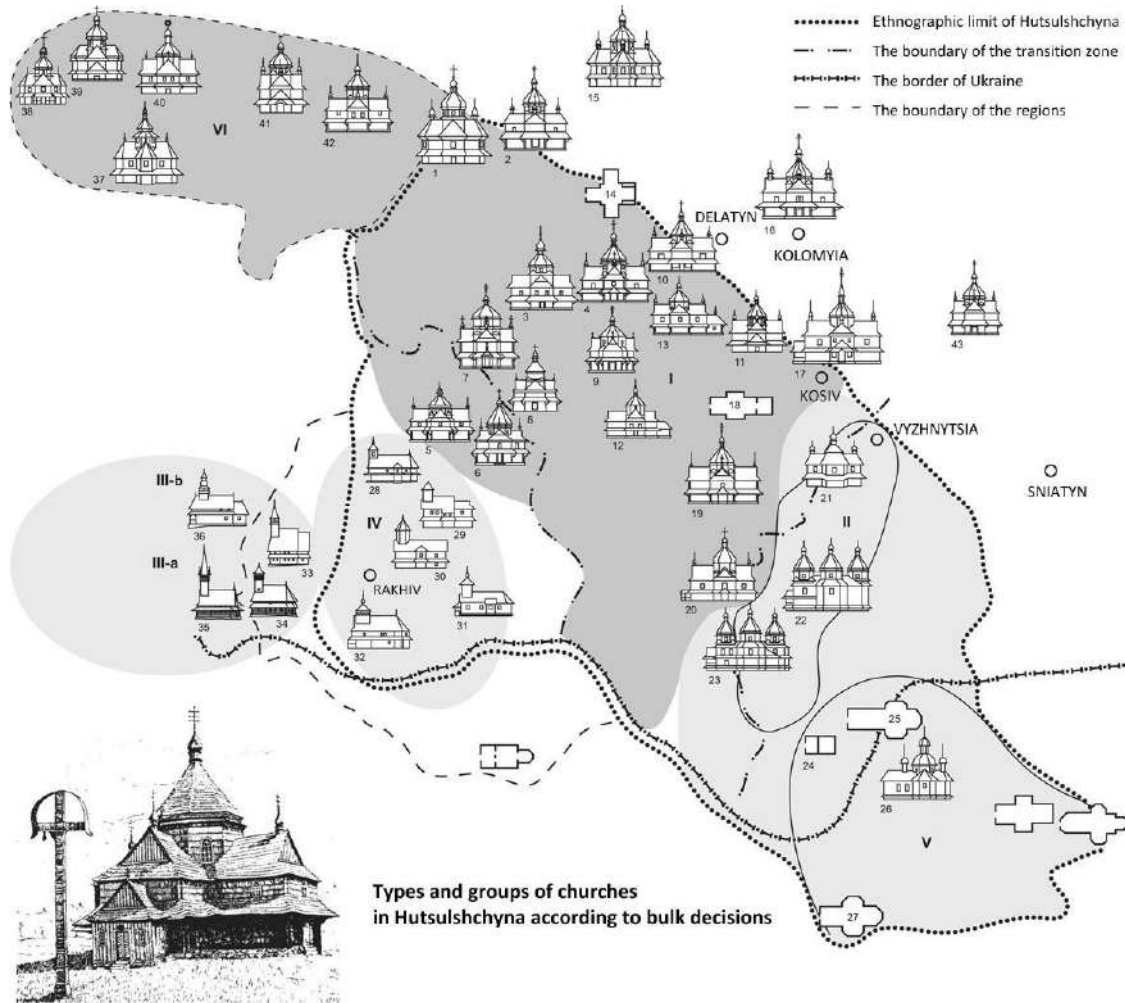
- on each ramen there are small crowns with crosses or only crosses on a conical basis;

- Architectural expressiveness is achieved by comparing equal masses, as well as slope of walls for the purpose of illusory increase of height in the interior and monumentality in the exterior;

- most churches have two doors: in the western and southern sides; window luminescences cut into the logs, four – in the drum;

- the walls are divided vertically by a wide hood, which encircles the church, rests on curved brackets; the transition between the wall, the roof and the top is carried out by a complex gzyms.

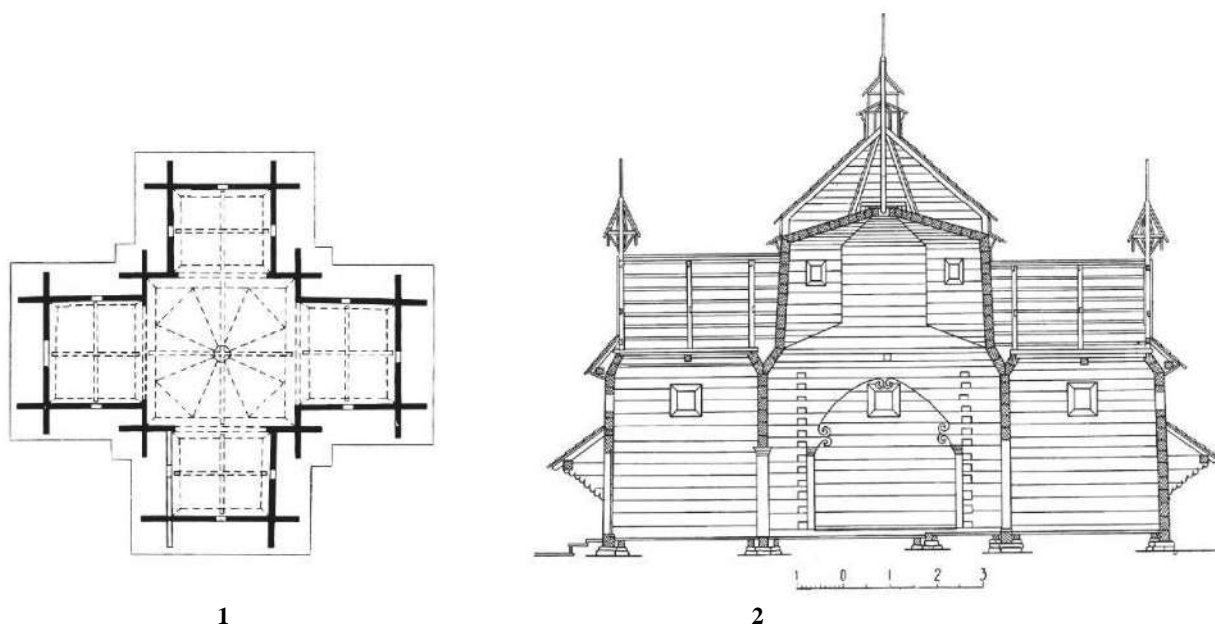
It is erroneous to assign all the cross-layout churches in the Carpathian Mountains to the Hutsulian school, as our studies show that this type is originated in Pokuttia and was associated with monasteries (Taras, 2003), the sacred architecture of the stone churches of the XIII–XIV centuries in Halych, Vasiliev, Lviv.



Types and groups of churches
in Hutsulshchyna according to bulk decisions

I. Hutsul classic type. The baptism of one-, three-, fifth-century churches **II.** Vyzhnyts'ko-Putyl's'ka hrupa. Trydil'ni trykonkhovi odno-, tryverkhi tserkvy **III-a.** Khusts'ko-Dubiv's'ka hrupa. Dvo-, tryzrubni tserkvy iz shplyevydnymy hotychnymy zavershenniamy, vysokymy dakhamy u riznykh rivniakh nad vivtarem ta tsentral'nym zrubom **III-b.** Velykobychkiv's'ka hrupa. Dvo-, tryzrubni tserkvy iz barokovymy vezhamy, vysokymy dakhamy u riznykh rivniakh nad vivtarem ta tsentral'nym zrubom **IV.** Bohdano-Yasin's'ka hrupa. Trydil'ni tserkvy z ramenamy-konkhamy z nevysokymy vezhamy na dakhu **V.** Pivdenno-Bukovyn's'ka hrupa. Trykonkhovi tserkvy z verkhom nad navoiu **VI.** Bolekhiv's'ko-Dolyn's'ko-Perehyn's'ka hrupa (v mezhakh Bojkivschyny)

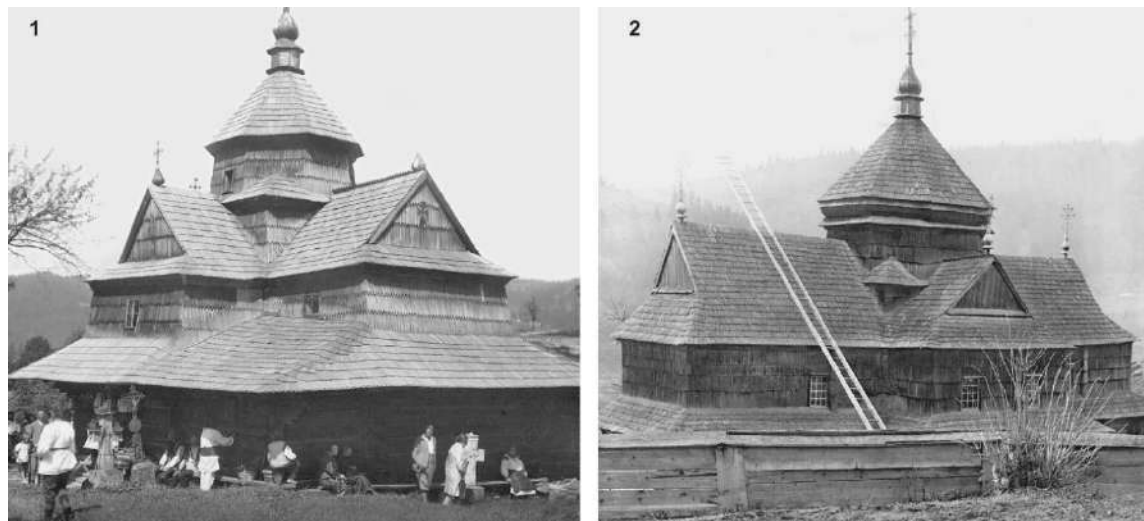
1. ts. Vozdvyzhennia. Maniava (monastyr-skyt). 1681; **2.** ts. Uspennia Pr. Bohorodytsi.Hvizd. 1739; **3.** ts. Ioana Mylostyvoho. Yaremcha. XVIII; **4.** ts. sv. Mykhajla. Yaremcha. XVII; **5.** ts. Voznesinnia Hospodn'oho.Yasinia. 1824; **6.** ts. Preobrazhennia Hospodn'oho.Lazeschyna. 1780; **7.** ts. Sv. Trijtsi. Mykulychyn. 1868; **8.** ts. Rizdva Pr. Bohorodytsi. Vorokhta. XVIII; **9.** ts. sv. Dmytra. Kremintsi (Tatariv). XVIII; **10.** ts. Zachattia. Bili Oslavy. 1746; **11.** ts. Uspennia Pr. Bohorodytsi. Pystyn'. 1858; **12.** ts. sv. Dmytra. Kosmach. XIX; **13.** ts. sv. Mykhajla. Liuchky. XIX; **14.** ts. Rizdva Pr. Bohorodytsi. Diliatyn. 1620; **15.** ts. Rizdva Pr. Bohorodytsi. Tysmenytsia. 1736; **16.** ts. Blahovischennia. Kolomyia. 1587, XVIII; **17.** ts. sv. Paraskevyy. Kosiv; **18.** ts. Voznesinnia. Brusturiv. 1785 **19.** ts. Rizdva Pr. Bohorodytsi. Kryvorivnia. 1818; **20.** ts. Petra i Pavla. Krasnoiliv. 1843; **21.** ts. Ivana Suchavs'koho. Vyzhenka. 1792; **22.** ts. sv. Vasylia. Koniatyn. 1790; **23.** ts.sv. Paraskevyy, Ust` Putyla, 1881; **24.** ts.sv. Mykolija, Verkhnij Yalovets`, XIX; **25.** ts. Rizdva Pr. Bohorodytsi, Seliatyn, XVII; **26.** ts. Vasylia, Sadin (Rumuniia), 187–1878; **27.** ts. Petra i Pavla. Kyrlybaba (Rumuniia), 1784; **28.** ts. Uspennia Pr. Bohorodytsi, Yasinis, 1836; **29.** ts. Pavla i Petra, Laxeschyna, 1780; **30.** ts. Rizdva Pr. Bohorodytsi, Kvasy, 1860; **31.** ts. sv. Triltsi, Roztoky. 1905; **32.** ts. Rizdva Pr. Bohodytsi, Dilove, 1750; **33.** ts. Mykoly (Verkhnia), Serednie Vodiane, 1428, XVIII; **34.** ts. mykoly (Nyzhnia), Serednie Vidiane, mid. XVII; **35.** ts. sv. Mykoly, Dibrova, 1604, XVIII; **36.** ts. Voznesinnia, Kobylets`ka Poliana, XVIII; **37.** ts. Voznesinnia Hospodn`jhj, Lypa, 1720–1901; **38.** ts. sv. Paraskevyy, Sloboda Bolekhiv's`kf, 1700. **39.** ts. Vvedennia v Khram Pr. Bohorodytsi, 1783; **40.** ts.sv. Vasylia, Roztochky, 1832; **41.** ts. v Tseniavi, 1745; **42.** ts. sv. Mykoly, Slyvky, 1760; **43.** ts.sv.Mykhajla, Ust`ie, 1853



Church of the Ascension of Jesus in Yasinya village. 1. Floor plan; 2. Cross section



Church of the Ascension of Jesus in Yasinya village.
3 General view. Drawings by Petro makushenko, photo by Florian Zapietal



Churches of Hutsul school of folk temple construction. Photo by V. Scherbakiv`kyj:

1. Church of the Nativity of the Blessed Virgin Mary in Vorokhta XVIII;

2. Snt. Michael's church in Dovhopole village, 1872

The architectural and ethnographic boundaries of the churches of the Hutsulshchyna do not coincide with the historical and ethnographic, which are defined by other classes of material and spiritual culture.

One can agree with the opinion of R. Brykovskii that "Hutsul form" appeared in these territories at a later time (Brykowski, 1995, s. 73, 92–96). This is evidenced by the construction of cross-layout churches. Most of the Hutsul churches are from the 19th and 20th centuries. There are several preserved monastery churches from the XVIII century. All of them are built in the area between Sukil and Limnytsya.

In general, wooden cross-layout churches in Hutsulshchyna, even though recognized as the creations of this ethnographic group and belong to the Hutsul school of folk temple construction, can not be at the same time an indicator for determining the boundaries of the historical and ethnographic region. They point out that the sacred construction known to us was formed here under the influence of certain historical and political circumstances, which contributed to the spread of cross-layout churches in the Hutsulshchyna from the Carpathian region in the XVII–XVIII centuries.

Hutsul masters have the longest tradition of building cross-layout churches. As in previous centuries, they are still spreading them to other areas.

Transcarpathian School of Folk Temple Construction

Traditional culture of Ukrainians of Transcarpathia attracted the attention of ethnographers in the XIX century (Transcarpathia in the Ukrainian ethnographic literature of the XIX century, 1989). They differed in their determination of its zoning (Tivodar, 1999, p. 4).

According to M. Tyvodar, Transcarpathia is an ethnographic zone, which "on the one hand has a considerable variegated population (Ukrainians, Hungarians, Romanians live compactly in certain territories, but Germans, Slovaks, Jews, Gypsies, Russians and other small groups in cities and villages), on the other hand, the ethnographic mosaic of the local Ukrainian population (hutsuls, boikos, dolyniany, lemkos and numerous local-territorial groups). This situation is typical of Transcarpathia since the Middle Ages" (Tivodar, 1999, p. 20).

The first one who considered the location of wooden churches in Transcarpathia by stylistic types was V. Zalozetsky. On the southern slopes of the Carpathians (within Eastern Slovakia and Carpathian Rus), he discovered "four types of wooden structures that are quite distinctly stylistically and geographically apart: pure centric towers [chreshaty. – Ya.T.] structures, elongated centric- baroque buildings, basilic gothic buildings, basil Baroque buildings" (Zaloziecky, 1926, s. 14; see also the translation of this work by I. Starosolsky: Zalozetsky, 2003).

Makushenko investigated the Churches of Transcarpathia within the boundaries of the USSR, identified the existence of four main groups. (Makushenko, 1976, p. 54). In particular, he paid attention to types of churches in Transcarpathia: Boykivsky, Lemkovsky, Hutsulsky, Baroque, Gothic (Pekar, 1977, pp. 413–419). At the same time, I. Mohitich studied Transcarpathian churches, he considered them by division into log-houses (one, two-, three-chreshaty), according to the volume-spatial solution (local type, single, double, triple, kreschaty). In Transcarpathia, he described the churches of Polyssia, Lemko, Boyko, and Hutsul (Mohitich, 1987, pp. 206–236).

G. Logvin refers to the Transcarpathian school only thirteen churches that have stepped towers, above the babinets – a tower-bell with a subterfuge, which has a gothic or baroque end (Logvin, 1999, pp. 459–462).

As we see, among architects, researchers of the Ukrainian traditional wooden churches, there is still no unanimous opinion about types of churches and criterias they should be attributed to the schools of the national temple building: Transcarpathian, Boykos, and Lemkos. This situation is complicated by the fact that ethnographers have not yet decided on the ethnographic regions of Transcarpathia and the neighboring Boykivshchyna, Lemkivshchyna, and Hutsulshchyna.

Most researchers classify Transcarpathian churches by architectural and constructive solutions, avoiding the issue of their connection with historical and ethnographic regions. This classification leads to mistakes. An obvious example of this approach is the churches of St. Svaliava-Bystry, 1588, 1759; Obawa, XVII century; Shelestove, beginning of the XVIII century, 1777; Ploske, (Canora), XVIII century, 1792; Glinianets, XVII century. R. Brykowski refers them to the south-eastern Lemkos type (Brykowski, 1986, pp. 162–168), and I. Mohitych considers them as the most completed type, which was created by Lemko construction school (Mohitich, 1987, p. 234). We can not agree with such definition.

First of all, these churches are located in the middle area of the Latorytzia River, that is, in the zone of direct contact with the Boykos churches, separated from the classical Lemkos type not only by a considerable distance, but also by Slovak types of churches, which on the other hand were to affect their architectural solution. M. Tivodar defines its inhabitants that “intertwine the traditions of the long-valley people and the Volovets's Boykos”, as Svaliavsky Volynians (Tivodar, 1999, p. 41).

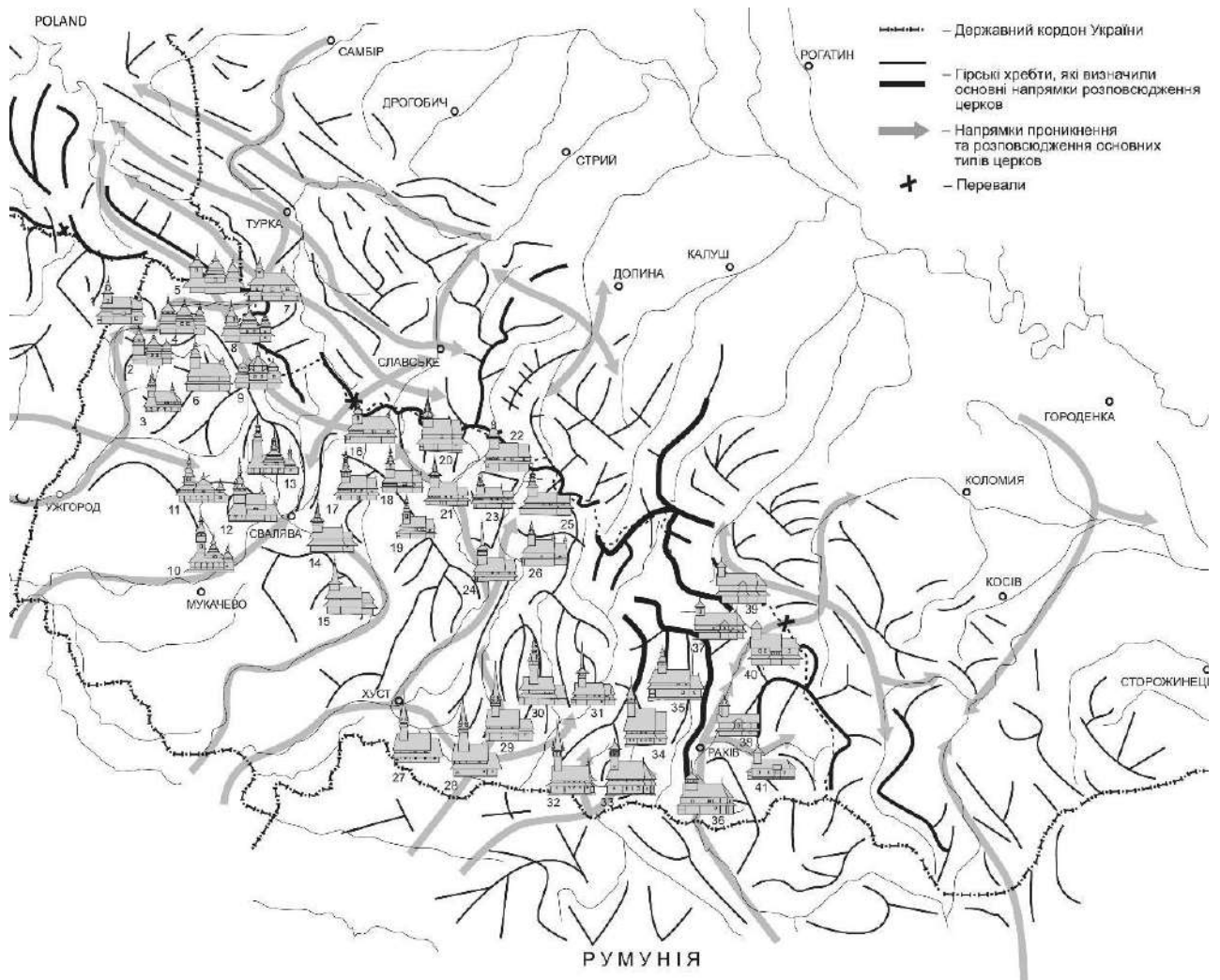
The boundary of Lemkivshchyna, according to M. Tivodar's research, lies “in the south-east – in the direction of Perechyn, more precisely, in the village Novoselytsia. The eastern part of Lemkivshchyna can be conventionally conducted along the river Uzh” (Tivodar, 1999, p. 42).

R. Reinfuss describes the churches “over the middle current of Latoritsia in the outskirts of Svaliava (Ploske, Obawa), that is, on the territory already belonging to the Boykos Region, called Verkhovyna there” (Reinfuss, 1978, p. 48).

A. Pekar, a researcher of the history of the Transcarpathian Church, notes that the churches in the Svaliava River, Latoritsa River, represent the final stage of the Boyko Temples development in the direction of the Baroque influences of the Lemkos type, “in which” the master was able to artistically combine these two types of churches into one, harmoniously and attractive integrity” (Pekar, 1977, p. 415). P. Makushenko does not refer those churches to the Lemkos type. In his opinion, this group “was formed as a result of influence of Baroque style on the Boykos church” (Makushenko, 1976, p. 64). Its origin is associated with the Baroque style, which affected the architecture of the tower and the completion of the upper parts of the logs. Secondly, the churches differ in compositional solutions of the main volumes. In classical Lemkos type, the development of volumes took place “by the method of” connection “to the existing church tower-shaped bells”, and in the Svaliava group “on the basis of the building of the three-towers church, where the tower-bell tower developed at the place of the empors or over the empore under the western influences” (Taras, 1999, p. 302). In the classical Lemkos type, the bell tower is located on its own basis or foundation, it contains a part or even whole Babynets, it is not architecturally and compositionally connected with the nave and the altar. In the Svaliava group, all three volumes constitute a single architecturally completed facility.

Obviously, it is mistaken to think that all the churches that have a tower over the babinets belong to Lemkos type. After all, joining the tower to the traditional church took place throughout the western Ukrainian

ethnic territory. Such an affiliation took place in Moldova, Romania (Taras, 1986, pp. 51–58). In Transcarpathia it was best to join the tower to the traditional Boyko church. We outline this group of churches in the Svaliava region as Boyko-Transcarpathian or Boyko-Svaliavo-Dolyniansky.



The location of Transcarpathian wooden churches relative to the mountain ranges

1. Ch. st. Vasyliia in Sil', XIX; 2. ch. Pokrovy Pr. Bohorodytsi in Kostryna, 1645, 1761; 3. ch. st. Mykoly in Chornoholova, XVII, 1794; 4. ch. st. Mykhajla in Vyshka, 1700, XVIII; 5. ch. st. Mykhajla in Uzhok, 1745; 6. ch. st. Anny in Bukivtseve, XVII, 1791; 7. ch. st. Stefana in Sianky, 1831; 8. ch. Ivana Predtechi in Sukhyj, 1700, 1769;
9. ch. st. Mykoly in Husnyj, 1655; 10. ch. st. Mykhajla in Shelestovo, beg. XVIII, 1772; 11. ch. st. Mykoly in Svaljava-Bystryj, 1588, 1759; 12. ch. Uspennia Pr. Bohorodytsi in Obava, XVIII; 13. ch. Pokrovy Pr. Bohorodytsi in Kanora, 1792; 14. ch. st. Mykoly in Plav`ia, XVIII. 15. ch. Pokrovy Pr. Bohorodytsi in Rososh, XVIII. 16. ch. st. Dukha in Huklyvyj, beg. XVIII; 17. ch. Rizdva Pr. Bohorodytsi in Pylpets`, 1780; 18. ch. st. Mykoly in Izky, XVIII, 1798;
19. ch. st. Mykoly in Podobovets`, XVII, 1785; 20. ch. st. Mykoly in Rekity, XVII, 1751; 21. ch. st. Dmytra in Repynne, 1780; 22. ch. Vvedennia Pr. Bohorodytsi in Torun`, 1809; 23. ch. Vvedennia Pr Bohorodytsi in Bukovets`, 1808; 24. ch. st. Mykhajla in Nehrovets`, end of XVIII, 1818; 25. ch. Pokrovy Pr. Bohorodytsi in Synevyr`s'ka Poliana, 1817; 26. ch. st. Dukha in Kolochava Horb, 1795; 27. ch. st. Mykoly in Sokyrnrtsia, beg. XVII, 1704; 28. ch. st. Mykhajla in Krajnykove, 1668;
29. ch. st. Paraskevyy in Oleksandrivka, XV, 1752; 30. ch. st. Mykoly in Kolodne, 1470, XVIII;
31. ch. st. Mykhajla in Neresnytsia, 1813; 32. ch. st. Mykoly in Dibrova, 1604, XVIII;
33. ch. st. Mykoly (nyzhnia) in Serednie Vodiane, mid. XVII; 34. ch. st. Mykoly (verkhnia) in Serednie Vodiane, 1428, XVIII;
35. ch. Voznesinnia in Kobylets'ka Poliana, XVIII; 36. ch. Rizdva Pr. Bohorodyts` in Dilove. 1750;
37. ch. Uspennia Pr. Bohorodytsi in Yasinia, 1836; 38. ch. Rizdva Pr. Bohoroduts` in Kvasy, 1860;
39. ch/ZhinokMyronosyts` in Stebnyj, 1856; 40. ch. Petra i Pavla in Lazeschyna, 1827; 41. ch. st. Trijtsi in Roztoky, 1905

Let's consider another group of churches, on the left bank of the river Uzh in the villages of Volosianka (XVIII century), Uzhok (1745), Vishka (1700, XVIII century), Suhyi (1700, 1769), Kostryna (1645, 1761), Gusnyi (1655), Perehrestnyi (1641), Chornoholova (17th century, 1794 was rebuilt). The mentioned churches are characterized by a three-domes plan, the presence of gabled roofs and a skeleton tower over the babinets. In this group, an attempt was made to add to the balanced solution, where the middle top dominates, the tower. Since it was necessary to break the existing centuries-old tradition, this process was rather cautious. In the churches of the villages Gusnyi and Upper Studenyi, the top of the tower is on the same level as the altar's top, and the top dominates the nave, in the churches of Uzhok and Perehrestnyi - the top of the tower does not exceed the top of the nave, and in the churches of Vishka, Sukhiy and Kostryna the top of the tower dominates above the peaks of nave and altar. The tower is installed on the overlop of the babinets log. These churches testify that there was a direct meeting of the eastern and western directions of sacred construction.

M. Tivodar notes: "Some Lemko influences are noticeable here, which gives grounds for interpreting this territory as a Boyk-Lemko inter-boundary" (Tivodar, 1995, p. 15). We associate these churches with the group of three-domed and three-tiered Boiko temples, in which was made an attempt to connect the tower to the church. We designate them architecturally as a group of three-churches, based on the Boyko and Western types of sacred buildings.

The largest group in Transcarpathia consists of churches in Volovets, Irshava, Mizhhiria, Rakhiv, Tiachiv and Khust regions, where the "connection" of the bell-tower took place over the western framework. According to P. Makushenko's research, "these structures have an influence on the architecture of Boykos and Lemkos, as well as Romanians and Hungarians" (Makushenko, 1976, p. 66). Architecture in these areas was originated from Transylvania (Makushenko, 1976, p. 66). P. Yurchenko believes that "this group of churches arose under the influence of not only gothic but also Romanesque styles" (Yurchenko, 1968, p. 36). Churches with a gothic roofs are not limited to the area of the Tisza River, they paved their way to the north on the valleys. We trace them in Irshava (Ivashkovitsa St., 1658, Lokit, 1734), Mizhhirsky (Maidan, XVIII centuries, Reckity, XVII century, 1752, Negrovets, XVIII cent., 1818.) and Tyachivsky (Ganychy, 1810, Pidplesha, XVIII cent., Russkoye Pole, XVIII centuries). (Makushenko, 1976, p. 70). Churches in the mountain valleys of the Mizhhirsky and Tyachivsky districts received Baroque completion of the bell-tower. According to the research of P. Makushenko, they are based on "three-domed Boyko church [...]. The tiled overlappings of the central and the altar structure under the influence of western tendencies disappear and turn into wooden barracks, and above the western building grows a high tower, a bell tower as an accent (Bukovets, 1898, Gull, 1780, Podobovets, XVII Art., 1785, Prislup, 1737, Torun, 1809) "(Makushenko, 1976, pp. 70–71).

According to the plans, this group of churches is attributed to the Boyko school, and by the bulk decision – to the gothic type of churches.

In the south-east, we have a group of Ukrainian three-partial churches covered with one or two roofs, with a small tower over the babinets (Church of the Assumption of the Virgin Mary, Yasinia, 1836, churches in the village of Kvasy, 1860, Stebnyi, 1856, Lazeshchyna, 1827, Roztoky, 1905). Churches were erected not only by local masters. Thus, the churches in the villages of Brusturi (Lopukhiv), the German Mokra, the Ruska Mokra, and the Königsfeld were built by masters from Ishliu and Gmind, that came here during the days of Maria Theresa (Haas, 1866, s. 6).

The above data shows that in Transcarpathia we have certain regional features, caused by socio-political and economic conditions. These features appeared in the national sacred construction only in the XVIII–XIX centuries: renovations, replacement of the top on the roof, the joining of the tower, the introduction of new solutions. It should be noted that there are no wooden gothic churches in other regions and "they can safely be included in the masterpieces of Ukrainian architecture" (Pecar, 1977, p. 419). All this gives a reason to explain that the Transcarpathian churches retained the general-Ukrainian content and, under western influences, developed their own types. Such a process can be traced mainly to Volovets, Irshava, Mizhhiria, Rakhiv, Tyachiv and Svaliava districts.

In these areas we have two groups: two-, three-logs churches with gothic and baroque spindletops, high roofs at different levels above the altar and the central part; trilateral churches and a low tower on the roof. The last group of churches was not numerous, appeared in the nineteenth century and it's associated with Moldovan influences.

Let's give a more profound character to the churches that belong to the Transcarpathian school. They are characterized by the following features:

– a three-partial (the square altar adjoins a slightly narrower altar and babinets), double-partial (babinets and nave of one width, narrower altar, in some cases with cut corners) plan;

– a tower-bell with carcass, crowned with a four-tent or octagonal tent roof, on which a gothic high spire is set up. In addition, four decorative turrets can be placed on the four other sides of the roof (s.Steblivka, Krajnikova, Sokirnitsa, Oleksandrivka). In the Baroque decision – there is an installing on a tower a quadrilateral pear-shaped tent of a lantern covered with a dash with a crown, an apple and a cross; the presence of gallery-by-door, which covers the western and central fronts (Colodne, Repynne, Maidan). On the west – entrance, which supports the wooden gallery around the church on carved columns with slopes (see: Kolodne, Repynne, Pryslop, Krainykove); the roofs are stepped (higher above the middle part and the tower over the babinets, lower above the altar); The wooden gallery run around the entire building or its western part (Maidan): the overlapping of the main volumes is formed by a three-centric curve in the cross section (nava, altar), flat (Babints, the exception are the churches in the village of Steblivka and Sokyrnitsa, where is the block ceiling).

Summarizing the above, we note that the sacred wooden architecture of Transcarpathia was formed in difficult geopolitical conditions: the territorial separation from Galicia for many centuries, the remoteness of the Ukrainians from the main body of ethnogenetic and ethno-consolidative processes of the Ukrainian nation, etc. All this contributed to the appearance of a large number of different volume planning decisions in this relatively small area. Here you can see a kind of multilayer, which took place under the influence of certain power factors.

We agree with V. Zalozetsky's statement that “our region [Zakarpattia.-Ya.T.] belongs to the Ukrainian territory, in which there was a collision of not only two building directions, but also two powerful cultures - the East-European Byzantine and Western-European Latin. Therefore, we have both forms of East and West European construction in architectural monuments” (Załozięcki, 1926, s. 9).



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Churches of Zakarpattia.

Group of Svaliava 1. Church of Snt. Nicholas, Svaliava-Bystryj, 1588, 1759;
Group of Velakyj Bychkiv. 2. Church of snt. Nicholas, Kolodne village, 1470, XVIII.
Photo taken by O.Ivanusiv

Lemko School of Folk Temple Construction (Taras, 1999, pp. 293–323; Taras, 2006, pp. 235–238). Historiography of ethnological issues about Lemkivshchyna in general is extremely large. It, in particular, has been elaborated in details by the modern researcher M. Mushinka (Mushinka, 1988, pp. 407–462). In the scientific literature, the word Lemkos, Lemko was firstly used in 1834 by O. Levitsky, and then in 1841 by I. Vagilevich (Wagilewicz, 1841; Vagilevich, 1965), in 1844 – P. Safarik, in 1851 – V. Pol. In the 1860s, there are works that give brief information about Lemkos origin and describe the geographical location of Lemkivshchyna (Toronsky, 1860). In the 1880s, Polish scholars M. Khilinsky, S. Udzelia, and I. Kopernytsky explored the material culture of Lemkivshchyna (Chyliński, 1884; Udziela, 1884; Kopernicki, 1889).

The definition of the Lemkos Church, as an illustration of the varieties of the sacred construction of the Carpathians, appeared in 1880 in the research of V. Miskovskii “Wooden Churches in the Carpathians” (Myskovsky, 1880). We can find out about the Lemko churches at the beginning of the XX century in the Lviv edition of K. Moklovsky's “Folk Art in Poland” (Mokłowski, 1903) and in the work of T. Spis “Wooden Churches and Churches in Galicia” (Spiss, 1912). Volodymyr Zalozetsky recognizes the existence of the Lemkos type and style. He notes that “according to the Ukrainian tribes of Lemkos, among which this type is common, also there is a style of those churches, which called Lemkos” (Załozięcki, 1926, s. 123; Mokłowski, 1903, s. 280–420).

The combination of the name of the Lemko ethnographic group with a specific type of church was carried out by a Czech researcher and photographer F. Zapletal in 1921–1924 (Zapletal, 1923, p. 117–121). Photo albums of B. Vavroušek were great contribution to the popularization of Lemko and Transcarpathian churches (Vavroušek, 1929; Vavroušek, Wirtha, 1929).

In the 1920's it was acknowledged that the architectural style inherent in this ethno-cultural group in Lemkivshchyna was dominated, at that time it received the Lemko Church name, the Lemko type. In 1927 V. Sichinsky determined the existence of a special type of church in Lemkivshchyna, and in 1940 he defined the boundaries of its distribution: “Lemko church preserved its type in the Carpathians from the upstream of the river Syan and Liabortsia in the south – to the west, the Upper flow of Topol and Poprad” (Siyńskyj, 1940).

In the 1930's, the term “Lemkivshchyna” received widespread publicity. Y. Tarnovich published a number of popular essays (Tarnovich, 1998).

In parallel with the study of ethnographic boundaries, R. Reinfuss (Reinfuss, 1936. *Etnograficzne granice ...*; Reinfuss, 1936. *W sprawie granicy ...*; Reinfuss, 1948), S. Stiber (Stiber, 1935) studied the churches of Lemkivshchyna. The Polish ethnographer R. Reinfuss gives a thorough analysis of the Lemko Church, that, like Boiko, also consists of three parts: the babinets, the central nave and the altar, based on timber ... The main characteristic of the Lemko Church is a tower, built over the babinets, that creates one whole with the church's house “(Reinfuss, 1978, p. 46; Rheinfuss, 1969). According to Reinfuss, “Lemko churches appear on the territory of Lemkivshchyna on both sides of the Carpathians, with the fact that they do not reach the eastern boundary of Lemkivshchyna on the northern side, and on the southern side it is far beyond its borders” (Reinfuss, 1978, p. 48).

Investigating Ukrainian churches in Poland, S. Gordinsky describes “Lemko churches with tower bells, which act only in the western and middle part of Lemkivshchyna” and churches without towers, “covered with four-deck low roofs. Three (or four, as in Comanch) copules with flashlights rise above them”. (Gordinsky, 1969, p. 9). He explains the distribution of Lemko churches within Poland and Slovakia (Gordinsky, 1969, p. 5). S. Hordynsky also acknowledges the existence of two types of wooden churches in Lemkivshchyna and gives a list of the reproductive material of the Lemko temples (Gordinsky, 1969, p. 10).

A. Varivoda, O. Volynets mentioned Lemkovsky churches in their researches. In particular, O. Volynets points out that there are several regional types, “the West-Lemko style that developed in these areas at the time of Baroque, somewhere in the beginning of the seventeenth century” (Varyvoda, 1978, p. 38–41; Volynets, 1969, pp. 77–83; Volynets, 1978, pp. 42–45). I. Chebyanyuk recognizes and gives a brief description to the existence of Lemko-type church. (Chebanyuk, 1971, p. 11).

The valuable source material about Lemko churches in Eastern Slovakia is given by B. Kovachevichov-Pushkarev and I. Pushkar. They examined, measured and described the churches in the “villages where Rusyns-Ukrainians live” (Kovachevichova-Pushkareva, Pushkar, 1971). Karmazin-Kakovsky

grouped them according to the time of construction (V. Karmazin-Kakovsky, 1975), gave a historical and architectural analysis to many Lemko churches in Poland.

I. Mohitich confirms the existence of the churches of Lemko building school. The formation of the temples of this school “took place as on the three-partial one-, two- and three-tiered churches, as well as on the two-partial one-and two-quadrants churches (Mohitich, 1987, p. 233).

V. Sichinsky, researcher of the Transcarpathian churches, points out that “on the Lemko region under the influence of Baroque architecture” during the XVIII century was created a kind of wooden churches, called Lemko-Baroque. At the heart of this is the old Boyko three-logs type, only “external scenery and newer applications have provided the churches of a different look” (Sichinsky, 1956, p. 104). According to A. Pekar, “a new constituent part of the Lemko temples was a tower-shaped, columnar construction of the tower-bell, completed with tricky baroque lanterns and baths that were set up over the entrance, that is, over the babinets” (Pekar, 1977, p. 414).

Polish professor R. Brykovskii made a fundamental research on the genesis of the Lemko Church, its architecture, presented the main types of churches in certain ethnographic regions of Lemkivshchyna. He concluded that “there are three distinct types of architecture on the Polish side of the Carpathians, and two are further in Slovakia and Rus Transcarpathian” (Brykowski, 1995, s. 82–205).

Within Poland, on the west and in the central regions of Lemkivshchyna (Novosadetsky, Gorlitsky, Yaselsky districts), on the side of Slovakia near the Polish border, there is a type of the church stands out as a northwest. It is characterized by the following features: a three-partial plan, based on three squares, nave is always wider (two-partial plan acts on the Slovak side). The building height is divided into separate parts, the nave is always higher; a tower with sloping walls, contains a part or the whole babinets; tent tops above the nave, the altar has zaloms with the same spaces. The tops of the tower, the nave, the altar finished with similar towers, which are completed by lanterns. Around the tower, and often around the eastern part of the babinets is a bypass; a high socle aligns the sloping walls of the tower, it is covered with tiles. According to R. Brykovsky, this group of churches is outlined as “classical style” or as “the classical church of Lemkivshchyna” (Brykowski, 1995). Such churches date back to the seventeenth and eighteenth centuries; their decline dates back to the last quarter of the eighteenth century.

The best examples of the classic Lemko style are the churches of St. Jacob in Povoroznyk, 1604; St. Mary the Protectress. Ukrainian church in Ovchar, 1653, 1701; St. Luka in Kviatkova, the second half of the seventeenth century; St. Paraskeva in Pantna, 1700; St. Mikhail in Sviatkova Velyka, 1757; St. Mikhail in Svyatkova Mala, 1762 (Brykowski, 1995, pp. 82–205; Brykowski, 1986, pp. 113–114, 120–121, 123, 132–133).

The tradition of building churches in the “classical Lemko style” was stronger and kept quite long in the Galician part of Lemkivshchyna, where the Greek Catholic Church played an important role in the birth of the national-cultural movement, which actually was the bearer of Ukrainian ethnicity. In the south, in the Transcarpathian Lemkos, the “classic Lemko style” disappeared at the end of the XVIII century. This happened because of the Hungarian authorities imposed an artificial Rusyn identity on the Lemkos (Lyubchik, 2008, pp. 10–11).

It should be noted that the regional (local) identity of Lemkos, that had extremely strong positions in the Galician part of Lemkivshchyna, suspended the process of destroying autochthonous architecture and its complete replacement with Catholic churches. The main changes were reflected in the Slovak part, where was a strong pressure from Hungary, it hadn't such force from the Polish side. Instead, among the Transcarpathian Lemkos, the Church was one of the means of the population's magyazation.

According to the research by R. Brykovskii, from the 70's of the eighteenth century to the 60's of the nineteenth century churches are being built by “northwest younger version” (Brykowski, 1995). It is characterized by: elongation of the nave, the altar, especially the babinets; irregular intervals of the zalom top structures; filling the intervals of rooms with the gzyms; frequent application of the granular altar (there are altars with such a plan from the Polish side of the Carpathians); the presence of sacristy, which is constructed together with the church.

This type arose under the influence of population growth, which required a larger area for believers (babinets, nave) and functional needs (sacristy).

The best examples of this type are in the churches of St. Mikhail in Red, 1760, 1766; St. Kozma and Demyan in Kotaki, at the turn of the 17–19th centuries; St. Dmitry in Stavisha, 1813, 1818; St. Kozma and

Demyan in Skwirtne, 1837; St. Luka in Yastrabik, beg. of the XIX century, 1837; St. Mary the Protectress. Ukrainian church in Ganchova, 1871; St. Mikhail in Dubne, 1853, 1863; St. Luka in Kunkova, 1868 (Brykowski, 1995, 86, Brykowski, 1986, 105–106, 108–109, 112, 129–130).

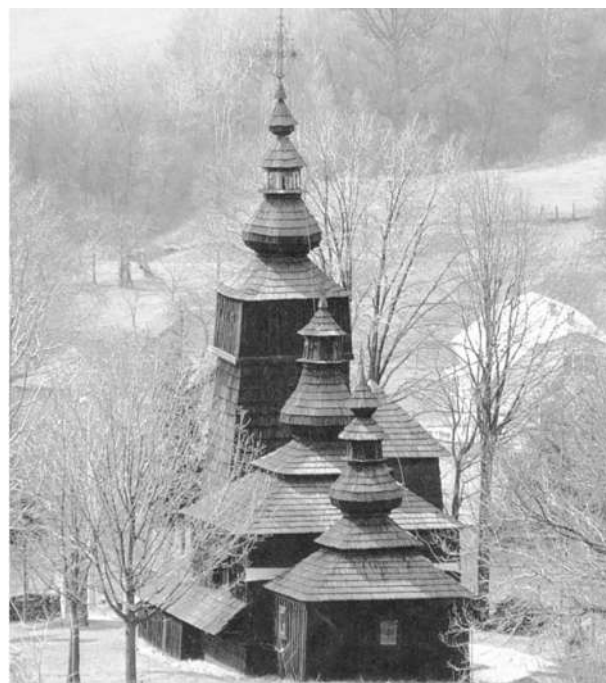
The third type, according to R. Brykowski, was named the northern, “schylkowy”, formed in the western and central regions of Lemkivshchyna on the Polish side of the Carpathians and is characterized by: a two-, three-partial plan; a granular altar with a performing sacristy; the absence of zalom top structures; instead of which there were two-deck roofs over each part of the church; a tower with sloping walls, surrounded by wooden tombstones, it remains dominant; exquisite decorative signatures on the nave and towers. Representatives of this type are the churches of St. Mary the Protectress. Church in Zdynia, 1786, 1795; The Nativity of the Blessed Virgin Mary, Church in Nowa Ves 1795; St. Mikhail's Church in Lose, 1800, 1810, 1826; St. Mikhail, Ropitsa Gorna (Ropitsa Ruska), 1813, 1819 (Brykowski, 1986, pp. 114–115, 119, 139).



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The types of Lemko School of Folk Churches. Photos by D. Duglas.

1. Church of snt. Mykola in Inovets', 1836; 2. Church of snt. Paraskeva in Potoky, 1773; 3. Church of Stretinnja Ghospodnjogo in Kozjany, second half of XIX; 4. Church of Immaculate Conception of Virgin Mary in Granitchno, 1785.

Another group of Lemko churches are on the East of the Polish part of Lemkivshchyna, near the Oslava River in the Sianok district, Lesko. R. R. Brykovsky described this group as a north-eastern type. It acts in two versions – the tower, and without a tower.

Churches with the tower are characterized by: an elongated nave plan, the addition on the axis of the pantry, additional space in the continuation of the altar (zahrystia); equal to the height of “zrub” of the three volumes of the church; the presence of one sloping roof over all volumes (once each volume had its own roof, which was completed by bathing lighthouses with signatures over the main parts of the church); a low frame tower, set up over the babinets. Examples of this option are the churches of All Saints in the village of Moschanets, 1834; St. Onuphriia, Vislok Dolny, 1850–1853 gg.; St. Dmitry, Radoshitsy, 1868; Virgin Mary's church, Schavhce, 1888-1889 gg .; St. Dmitry, Bodaky, 1902 (Brykowski, 1995, s. 87. Brykowski, 1986, pp. 100, 125, 135–137).



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The types of Lemko School of Folk Churches. Photos by D. Douglas.

1. Church of St. Mykhail in Prykra, 1777; 2. Church of St. Mykhola in Kozukhivtsi, 1741;
3. Church of St. Mykhail in Rus' kyj Potik, mad.XVIII; 4. Church of St. Mykola in Rus'ka Bystra, b.XVIII

Churches without tower are characterized by: the presence on the longitudinal axis of the church, at a certain distance from it, the tower-bell of the frame structure; plan – three partial, with the addition of pantry equal to the babinets width; height of all parts, the altar, the nave and the babinets are covered with tops, which are hidden under a common roof, crowned over the main volumes of signatures on the small towers.

The emergence of these types is associated with the fact that “the whole Lemkivshchyna up to 70-ies-18 centuries was subordinated to the Roman Catholic bishop in Krakow, and only at the end of that century went back to the Greek Catholic bishop in Przemyśl” (Gordinsky, 1969, p. 8).

Representatives of that version of the northeastern type are the churches of St. Mikhail, Zubens'ko, 1789; St. Mary the Protectress. Church in Comancha, 1800-1803; St. Mikhail, Turin, 1801–1803, 1838; St. Nicholas, Reped, 1824, 1826; St. Virgin Mary, Sinyava, 1874 (Brykowski, 1995, pp. 82–205; Brykowski, 1986, pp. 107–108, 127–128, 133, 140).

The churches of the north-eastern type of both variants have not been built a lot.

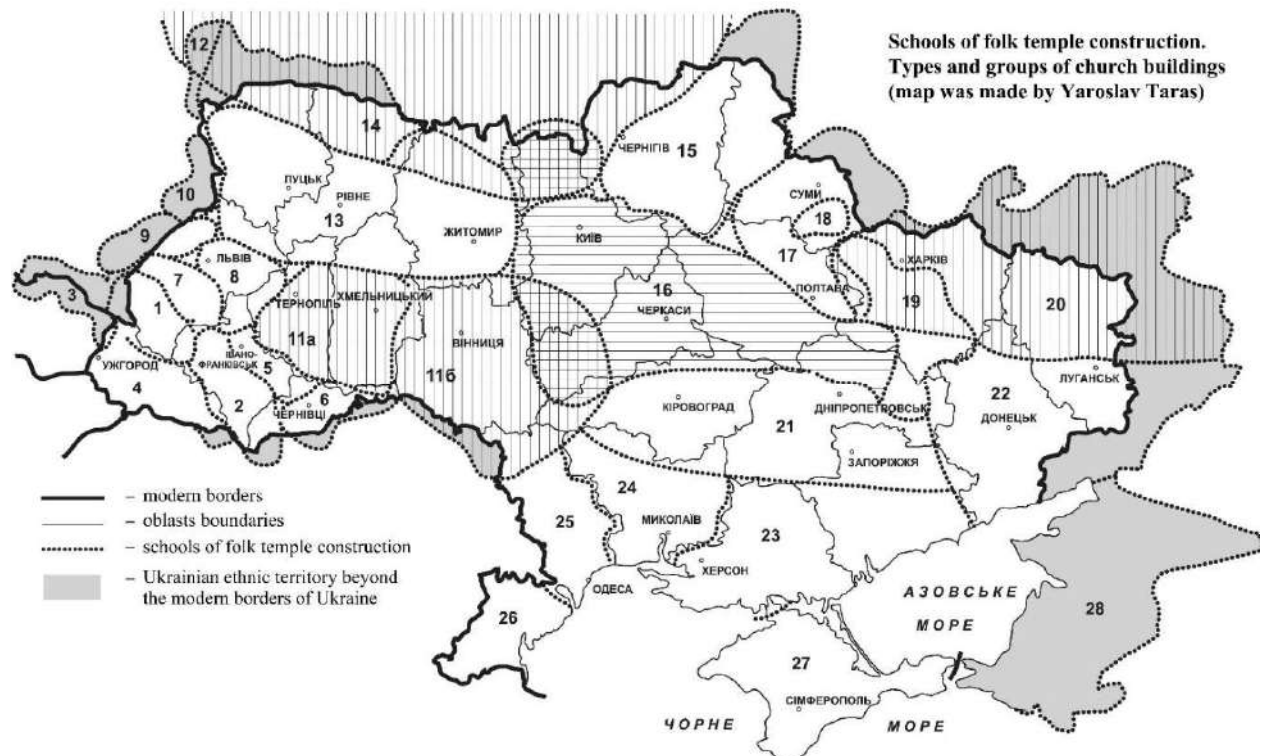
In Slovakia, according to R. Brykovsky, there is a southern type that differs from churches in Poland by having a double-plan; square in the plan of the altar, elongated rectangular nave with an internal, separated babinets; a tower with a false subterfuge (*pidsubyttiam*) set up not on the ground, but on the zrub of the western part of the nave; nave, the tower is covered with tents, which end with onion piles. Examples of this type are the churches of St. Nicholas, Lipovets, 1703; St. Basil, Kraine Chorne, mid. of XVIII century; St. Mikhail, Shemetkivtsi, 1752–1753 gg; Virgin Mary, Koreivci, 1764; St. Mikhail, Upper Hrabovets, XVIII century. (Brykowski, 1995, pp. 87–88; Brykowski 1986, 114, 148, 150, 159).

Within Transcarpathian Russia, according to R. Brykovskii, there is a south-eastern type, which is represented by monuments of the XVIII century. Characterized by a double-partial plan (square altar, elongated rectangular nave with an internal babinets); a tower with straight walls, which are planted on a logs of the babinets; vertices with gaps completed with signatures; a wide space, surrounded by a part of the tower and the nave, and ending with roof on the altar. Examples of this type are the churches of St. Mikhail, Medvedivci, beg. XVIII centuries, since 1927 – in Prague; St. Mikhail, Glinets, 1770, XVIII cent., since 1931 – in Kinchitsy, Moravia; St. Mary Descent of St. Spirit, Obawa, beg. XVIII centuries, since 1930 – in New Paci, Czech Republic; St. Mary the Protectress. Church in Canora (Ploske), 1792, since 1975 – in Kyiv; St. Mikhail, Shelestove, 1776, since 1927 – in Mukachevo, and since 1976 – in Uzhgorod; St. Mykola, Svaliava-Bystry, 1759 (Brykowski, 1986, pp. 162–168).

On the basis of the research of predecessors, we will give a general description of Lemko school of folk temple building. It is characterized by a single, double, three partial church plan, with square double or triple tents, necessarily topped with baroque decks above the central and eastern logs, and above the western skeleton of the babinets stands a bell tower, which is also crowned with Baroque piles. The local difference of the Lemko type from general-Ukrainian is that it is based on an asymmetric composition with a distinct fall of heights from the west to the east, rather than the symmetrical equilibrium of the proportions between the upper and lower parts of the altar.

Lemko types of churches are mostly formed on the basis of adding to the nave, the babinets, to the altar – (*zahrystia*) additional space, by completing the church tower, mainly the width of the babinets, that is set up on the ground (adjoins to the nave or is at a distance from it).

The appearance of the Lemko Church is explained by a massive modification of the two partial churches that took place in the 16th–17th centuries by the annex of the carcass tower-bell of the eighteenth century. (Kovachevichova-Pushkareva, Pushkar, 1971, p. 11). This was an artificial “by the annex or superstructure above the babinets, sometimes self-supporting frame structure, not structurally linked with the last one” (Mohitich, 1987, p. 229). So, as I. Mogitich correctly notes, “the church in the village of Trochany can be a vivid example for Lemkivshchyna. It was built as three-partial, no later than on the beginning of XVIII century. In 1739 a high tower-bell was placed on the church on its own foundations” (Mohitich, 1987, p. 229). The accession to the church of the tower, R. Reinfuss, refers to the influence of the Latin churches.



Conclusion

Studies have shown that in places where meets the Eastern type of church with the West, there is a synthesis of architectural and constructive solutions that gives new types of churches. The emergence of new types in the Ukrainian ethnic territory depends on the time and place of such a meeting.

The division of the ethnic territory of Ukrainians of the Carpathians by the common and consistent architectural and constructive decisions of the churches showed the following:

- for centuries, the Transcarpathian separation from the Carpathian region has been manifested in the architecture of the Churches of Transcarpathia, the force factors have changed the nature of construction, have created a complex topography – the emergence of four groups of churches that have synthesized architectural decisions within the boundaries of ethnographic groups;

- the spread of the Ukrainian population to the West, finding it surrounded by Polish and Slovak ethnic groups not only contributed to the development of the Lemko type of church, which preserves the integrity of the features of planning with the general-Ukrainian, but also forms a complex topography of certain types of churches that can be classified in a three-dimensional solution both in terms of architectural and ethnographic features;

- the greatest integrity in terms of architectural and constructive features is preserved by wooden churches, located within the historical and ethnographic regions of Boykivshchyna, Gutsulshchyna; The most remarkable are the groups of churches of Lemkivshchyna and Transcarpathia. Especially productive are ethno-contact zones between Boykivshchyna and Transcarpathia, Boykivshchina and Lemkivshchina, Hutsulshchina and Bukovina. This is the area where we have received the most architectural decisions.

In these zones there is basis for the allocation of the Boyko-Transcarpathian, Lemko-Transcarpathian, Transcarpathian-Maramorosh, Hutsul-Bukovynian, Pokut-Hutsul types of churches.

Three Carpathian schools of folk temple construction (Boykiv, Hutsul, Lemkivsky) were identified in the Carpathian region, and other types and groups of churches were discovered in the historical and geographical region of Zakarpattia. Within the limits of the historical and ethnographic massif of the Boykivshchyna there are 2 types and 3 groups of churches, Hutsulshchyna – 1 type, 1 group, Lemkivshchyna- 8 types; Within the historical and geographical region of Transcarpathia there are 8 groups.

The wooden church architecture of Ukrainian Carpathians, in the forms and symbols of which the mountaineers have discovered and preserved the general-Ukrainian community and the regional specificity, is a historical phenomenon and the highest form of folk traditional building culture.

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Ярослав Тарас

ШКОЛИ НАРОДНОГО ХРАМОВОГО БУДІВНИЦТВА, ТИПИ ТА ГРУПИ ЦЕРКОВ КАРПАТ

***Анотація.** Встановлено, що сакральна дерев'яна архітектура українців Карпат, у формах і символах якої горяни виявили і зберегли загальноукраїнську спільність та яскраву регіональну специфіку, є історичним феноменом і найвищим виразом народної традиційної будівельної культури.*

Дослідження показали, що в місцях, де трапляється східний тип церкви із західним, відбувається синтез архітектурно-конструктивних рішень, який дає нові типи церков. Поява нових типів на українській етнічній території залежить від часу і місця такої зустрічі.

Поділ етнічної території українців Карпат за спільними та сталими архітектурно-конструктивними рішеннями церков показав, що:

– тривала, впродовж століть, відірваність Закарпаття від Прикарпаття проявилася на архітектурі церков Закарпаття, силові чинники змінили характер будівництва, утворили складну топографію – появу чотирьох груп церков, які мають синтезовані архітектурні рішення на межах етнографічних груп;

– поширення українського населення на захід, знаходження його в оточенні польського і словацького етносів не тільки сприяло виробленню лемківського типу церкви, який зберігає цілісність за ознаками планування із загальноукраїнським, а й формує на об'ємному рішенні складну топографію з певних типів церков, які можна класифікувати і за архітектурними, і етнографічними ознаками;

– найбільшу цілісність за архітектурно-конструктивними ознаками зберігають дерев'яні церкви, розташовані у межах історико-етнографічних районів Бойківщина, Гуцульщина; найяскравішими щодо груп церков є Лемківщина і Закарпаття. Особливо продуктивними є етноконтактні зони між Бойківщиною і Закарпаттям, Бойківщиною і Лемківщиною, Гуцульщиною і Буковиною. Це зони, де ми одержали найбільшу кількість архітектурних вирішень.

У цих зонах є підстави для виділення бойківсько-закарпатського, лемківсько-закарпатського, закарпатсько-марамороського, гуцульсько-буковинського, покутсько-гуцульського типів церков.

В Карпатському регіоні ідентифіковано три школи народного храмового будівництва (бойківська, гуцульська, лемківська), в історико-географічному районі Закарпаття виявлені також й інші типи та групи церков. У межах історико-етнографічного масиву Бойківщини маємо 2 типи та 3 групи церков, Гуцульщини – 1 тип, 1 групу, Лемківщини – 8 типів; у межах історико-географічного району Закарпаття – 8 груп.

Церковна дерев'яна архітектура українців Карпат, у формах і символах якої горяни виявили і зберегли загальноукраїнську спільність та яскраву регіональну специфіку, є історичним феноменом і найвищим виразом народної традиційної будівельної культури.

Ключові слова: Бойківщина, Гуцульщина, Лемківщина, Закарпаття, школа народного храмового будівництва, дерев'яна церква, Карпати.

ARCHITECTURE OF BUILDINGS AND EDIFICES

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**URBAN LOCALIZATION PRINCIPLES
OF PUBLIC CATERING ENTERPRISES**

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Abstract. The article examines the main options for placement of catering establishments in the structure of cities and settlements, reveals their specific features and provides recommendations regarding the location of certain types of catering establishments in accommodation options. Examples of placement of catering establishments of modern domestic and foreign food establishments were taken to analyze accommodation options.

Key words: catering, city, location, territory, urban areas, planning.

Formulation of the problem

Modern catering industries act as independent elements of urban development, so complex, located in the structure of administrative, entertainment, shopping centers, large, medium, small public buildings or complexes. Extensions of catering industries types and the direct impact on the social life of the population gives rise to a detailed consideration of the location of modern food establishments in the city structure.

Analysis of Recent Research and Publications

The topic of location of catering establishments in the city structure was considered in the works of the authors: V. P. Urenov “Catering Enterprises” outlines the principles of placement of catering establishments on sites and in the structure of urban development; V. I. Karsekin “Optimization of the location of catering establishments”, the issue of calculating the needs of individual districts in the network of catering establishments was considered. Models of definition of schemes of rational placement of catering establishments are offered; V.A. Eksaryov “Basic principles of formation of types of public catering establishments on highways” are defined principles of formation of types of public catering establishments in the conditions of their functioning on highways. T. Nikulenkova etc. All the works highlight the location of urban development as one of the important factors that affect the provision of public catering and profitability of enterprises. Based on the researches already carried out and guided by the modern dynamic growth of the catering enterprise, their modernization and the emergence of new formats of establishments, it becomes urgent to question the principles of modern placement of the catering enterprise.

Analysis of recent research and publications

The development of this topic contributed to the work on the theoretical problems of modern architecture and urban development of famous Ukrainian and foreign scientists: M. M. Demina, L. P. Lavrova, Yu. S. Asayeva, V. P. Urenova, G. I. Lavrika, V. F. Makukhina, T. F. Panchenko, O. L. Podgorny etc. The history of catering establishments is presented in the works of: I. V. Volkova, G. V. Baranovsky, V. M. Timiryanova, V. P. Urenova. Creation of architectural and spatial structure of catering facilities and their urban planning are dedicated to the works of such authors as: V. V. Adamovich, E. A. Akhmedova, L. E. Baklikskaya, V. P. Urenov, V. A. Eksaryov, V. I. Karsekin, A. L. Gelfond, T. Conran, V. A. Nefedov, T. T. Nikulenkova, N. M. Reznikov, V. P. Urenev. The issues of architectural formation of new types of catering and their functional and space-planning organization are considered in the works of A. I. Breusa, N. S. Bogdanova, I. P. Vasilyeva, V. P. Urenyova, I. R. Fedoseeva and others. The following works were used to cover issues on the specifics of the formation of the architectural environment: Galimshina A. A., Efimova O. V., Nefedova V. A., Perova A. F., Pomorova S. B., Shimko V. T., Urenova V. P., Chernyshova E. P., Yankovskaya Yu. S. Stylistic features of the formation of interiors of objects of public catering are devoted to the works of Russian authors Volkov Yu. F., Denisova N. I., Pyankov A. and their foreign colleagues Baraban Regina S., Colgan S., Mealey L.; Issues of organization of production and service at catering facilities are investigated by: Arustamov E. A., Baranovsky V. A., Gayvoronsky K. Ya., Kalashnikov A. Yu., Kondratiev K. P., Lawler E., Nikulenkova T. T., Radchenko L. O. Based on the researches already carried out and guided by the modern dynamic growth of the catering enterprise, their modernization and the emergence of new formats of establishments, it becomes urgent to question the principles of modern placement of the catering enterprise.

The purpose, to analyze, summarize and systematize the domestic and foreign experience of placement of modern catering establishments in the structure of the urban environment and on the basis of the analysis to form the basic principles of their placement.

Presenting main material

The catering network is being designed as a single interconnected system. The choice of types and their location in urban development depends on the frequency of visits to these businesses and the functions they perform: daily meals for a limited period of time (dining, cafes, eateries) or food combined with recreation, entertainment (restaurants, specialty cafes, bars).

The modern city is a place of high concentration of population with high density of construction, with clear zoning on industrial, administrative, residential, communal – warehouse zones. Each of these zones has its own peculiarities, planning decision, character of development, a certain contingent of the population, which directly influences the design of the network of public catering establishments, and defines it as open (public) or closed to serve a certain category of population.

Enterprises of the open network in urban development place both individual and residential buildings, hotels, shopping centers, railway stations, airports, motorways, suburban areas, recreation areas, resorts, etc. Various accommodation options and conditions impose certain requirements on the food establishments, due to the peculiarities of their location and functional purpose: approximation of catering establishments to the consumer and placement on the main routes of mass flows of the population; low cost time to eat, variety and quality of healthy food.

For optimum development and improvement of the system of catering it is necessary to take into account a number of factors: features of the settlement of its construction, location, number of local population and visitors of the city, location of production enterprises, socio-cultural, administrative and educational institutions, the value of the population's cash income, demand for catering, etc.

In the analysis of modern public catering enterprises, attention was paid to the location of food establishments in the structure of the city, both individual and complex of public buildings, location in close


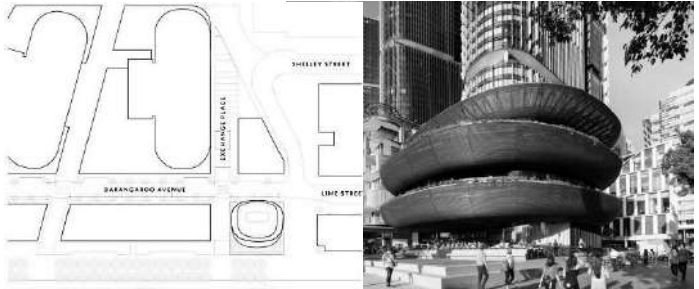


proximity to pedestrian paths, with connection to transport connections. The criteria for highlighting the principles of catering in the comparative analysis are:






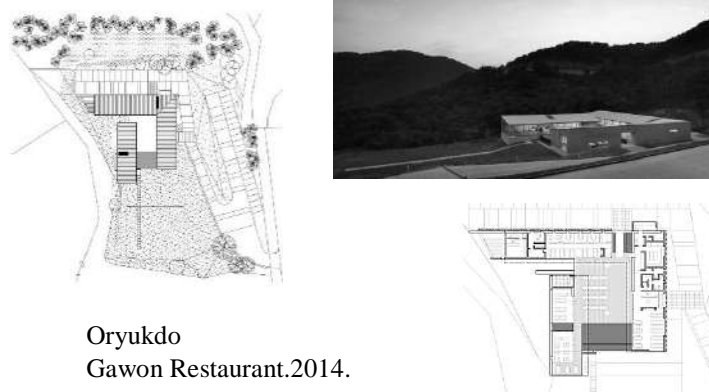

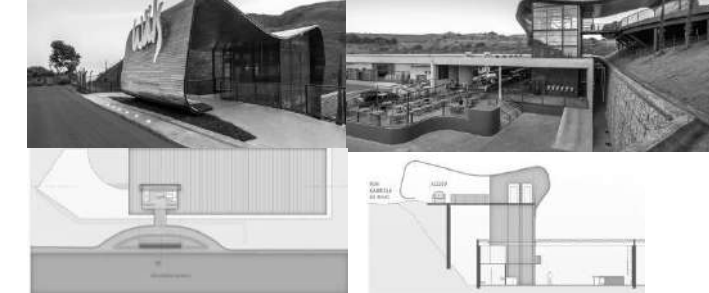
- placement in the structure of urban development – city center, residential areas, periphery, industrial district, historical center, recreation area, suburban area, transport – pedestrian paths, motorways, non-standard location, mobile without binding to a certain place, etc;
- types of catering businesses – restaurants, cafes, bars, cafeterias, fast food establishments and more. More than 50 domestic and foreign food items have been analyzed. In the course of the comparative analysis the principles of modern placement of catering establishments were revealed.





Catering industry accommodation in the city center

Concentration of businesses in the city center is usually quite profitable. Given the large number of shops, office and public buildings, the centers are becoming more attractive to catering establishments than other areas of the city. This is facilitated by the convenient transport accessibility of the population and the pedestrian paths with great walkability. However, there are a number of placement issues. Many businesses located on the ground floor and basement have no entrances and parking spaces (reflected in the accumulation of traffic on the carriageway), poorly developed, and sometimes simply absent commercial area with unloading sites. An entrepreneur interested in the financial side of his enterprise does not always follow the regulatory framework. Mainly in the centers of cities catering establishments are not large establishments with production on the semi-finished products with high degree of readiness (cafes, eateries, bars, mobile food establishments, fast food). High-end restaurants, large-format establishments as a whole appear downtown rarely, or already exist based on historic or remodeled properties.

PRINCIPLES OF LOCATION OF CATERING ESTABLISHMENTS IN THE CITY STRUCTURE

downtown		
		Restaurant Barangaroo, Australia, Architects: Collins and Turner 2017.
in a residential area		

<p>in the recreation area</p>		 <p>Restaurant SÃO PAULO, Brazil. Architects: mass arquitetura, Norea De Vitto. 2012.</p>
<p>in the historic center</p>		 <p>Rocks Polis Station Bar, Sidney, Australia, 2013.</p>
<p>in the suburbs</p>		 <p>Oryukdo Gawon Restaurant.2014.</p>
<p>on motorways</p>		 <p>Olhos D`agua, Brazil,2017.</p>

on pedestrian paths		 <p style="text-align: center;">Bar MELBOURNE, AUSTRALIA. 2015.</p>
Mobile catering services		

Accommodation of catering establishments in residential (dormitory) areas of the city

One of the most common catering placements is accommodation in residential areas, evenly within walking distance, taking into account public transport stops and pedestrian traffic. The main advantage of such accommodation is the availability of free areas for the design of new catering establishments with a full cycle of cooking (restaurants, canteens, specialized cafes), the construction of multifunctional complexes including catering establishments. The disadvantage is the dependence of the occupancy of the institution on the season, time of day, days of the week. In the design and construction of modern residential buildings, as a rule, the first floors are given to accommodate service establishments, including catering establishments. As in the city center, catering businesses in residential development are focused on pedestrian and transport accessibility, which implies the interconnection of establishments with the central areas of the city. Catering establishments, located in separate buildings, are mainly intended to serve large residential areas – restaurants, canteens, specialized cafes, bars. Their three-dimensional planning and technological solutions are varied, and the architectural composition depends on the specific conditions of the location and environment. Catering establishments located on the ground or basement floors of residential buildings are designed to serve a small number of visitors directly residing or working in a residential area. Due to this they do not have a large number of seats. The disadvantage of these options is the limitations of the three-dimensional planning and design solutions.

Accommodation of catering establishments in the recreational area of the city

The location of catering facilities in park areas, squares, near reservoirs is the most attractive. The peculiarity of such accommodation is the high pass ability of people, ecological and aesthetic characteristics of the terrain, the relationship of the food establishment with the natural environment, the integration of nature into the interior and vice versa from interior to exterior. As a rule, the spot of construction of a catering facility has restrictions within the permitted construction in the security zone, access to such establishments is via pedestrian paths, and the entrances are organized separately, only for technical transport. Mostly in the recreational areas are located catering establishments that work in the semi-finished products with minimizing production processes (restaurants, cafes, bars, fast food, theme restaurants, clubs, mobile sites).

Accommodation of catering establishments in the historical center (protected areas, security zones)

Designing of catering at the historic center is mainly focused on tourist flows. A special feature of the design is the attraction of visitors by the theme of the place where the catering establishment is located, but there are territorial restrictions that are reflected in the three-dimensional planning organization of catering establishments. Such facilities are generally within walking distance. Transportation accessibility is limited as often historic centers and security zones have a border in the form of fortresses, fences and natural obstacles. The establishments operate on semi-finished products with a high degree of readiness (theme restaurants, cafes, bars). Important when designing a catering company in the historical center (protected area, security zone) is not to break the integrity of the ensemble. Introduce the new into the historical environment so that it becomes part of the existing structure, regardless of whether it is new architecture or a good stylization.

Public catering facilities in the suburbs

The advantage of such a modern catering facility is the availability of free territories, which allows to create large-format establishments with a full cycle of both raw materials and semi-finished products with a high degree of readiness (restaurants, cafes, clubs) with an expanded range of services and convenient infrastructure. Since these catering facilities are geared more for the long-term stay of visitors in the territory of the establishment, which provides a wide range of services: organization of mini zoos, self-catering facilities equipped with barbecue facilities, children's playgrounds, stables, tracks, organization of parking places for visitors etc. The possibility of using the natural landscape, the aesthetic characteristics of the terrain makes this catering accommodation attractive to residents of cities. The disadvantages include limited pedestrian and transport accessibility.

Placement of catering establishments on motorways

Highways are one of the most common modern catering placements. With the mass development of road transport and the increase in the level of mobility of the population, the design of catering on motorways remains relevant. Modern food facilities are located on the motorways as stand-alone, or as a part of complexes of service stations, roadside motels, located in conjunction with gas stations and recreation areas (mini-hotels), campsites. These enterprises are not characterized by the uniformity of loading over the seasons and during the day, as well as the diversity of the content they serve. Businesses can be located along the road, away from the road, less often at the intersection of roads. In the world, there are options for placing blocks of catering on both sides of the highway, which are combined by

underground or above ground crossings, and there are restaurants built as a bridge over the roadway. Pedestrian accessibility to food establishments is virtually limited.

Placement of catering establishments on pedestrian traffic routes

The common location of catering establishments is the city's street and road network, namely transport and pedestrian communications (pedestrian paths, above ground and underground crossings, stops, subway stations) providing convenient, safe and fast connections to all functional zones and public areas. As a rule, such places are cafes, eateries, fast food establishments.

Not standard catering accommodation

Modern restaurants are trying to attract and retain visitors not only by delicious food, unusual interior design, but also non-standard catering accommodation. So in the world practice there is a restaurant with places for visitors at the Yellow Treehouse Restaurant; New Zealand, Snøhetta Restaurant, Norway, is located on the seafront and also operates as a marine life research center. The principle of non-standard catering is fairly new, has no mass design, but is interesting and modern.

Mobile placement of catering services

Mobile retail is increasingly used in modern cities. The high cost of rental does not allow small and affordable points of nutrition to be built in the centers of major cities, and existing restaurants and cafes often provide too expensive and at the same time slow services, while the pace of life dictates its conditions. Urban life is dynamic, and it can only be reached on wheels, giving buyers the opportunity for quick and quality service at a reasonable price. One of the world's most widely used fast food options, wherever needed, is mobile cafes and cafes offering a wide variety of drinks and dishes. Mobile cafes are used for organizing of catering in crowded places: fairs, entertainment events, city events involving large numbers of people, open-air flash mobs in parks, squares and streets, etc. In some cases, mobile food outlets work well not far from business and office complexes, which employ a large number of people, but there is a shortage of affordable catering facilities. Advantages: mobility and dynamism, possibility of fast provision of catering services in places where it is necessary and actual, ease of deployment of a point of food.

Conclusion

Considering all the above, it can be argued that catering is an integral part of the structure of urban and suburban space. Based on the analysis of modern catering enterprises, the criteria of the principles of their placement are revealed, which are directly related to the characteristics of catering establishments, the specifics and the expediency of their placement in urban development.

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Наталія Колеснікова

ПРИНЦИПИ РОЗМІЩЕННЯ ПІДПРИЄМСТВ ГРОМАДСЬКОГО ХАРЧУВАННЯ В СТРУКТУРІ МІСТА

***Анотація.** В статті розглянуто основні варіанти розміщення підприємств громадського харчування в структурі міст та населених пунктів, виявлено їхні характерні особливості та дано рекомендації щодо розташування окремих типів підприємств громадського харчування в варіантах розміщення. Для аналізу варіантів розміщення було взято приклади розміщення підприємств громадського харчування сучасних вітчизняних та закордонних об'єктів харчування.*

***Ключові слова:** підприємства громадського харчування (п.г.х.), місто, розміщення, територія, містобудівельні зони, планування.*

Tetiana Rumilets

MEDIA LIBRARY AS A PROGRESSIVE MULTIFUNCTIONAL SPACE

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Abstract. The article considers the evolution of the public library, the modern functional zones of the library and their importance in the life of society. The international experience of developing public libraries was analyzed. It reveals that the library had turned into a multimedia library under the influence of technology, and later, under the influence of society, turned into a multimedia library center. A four-space model for the functional purpose of the space of the modern library is considered. The model is used to build new libraries, modify existing libraries, and design the interiors of individual library spaces. Studies have found that the model embodies four common goals for the public library: Experience, Empowerment, Engagement and Innovation. A term for defining a “multimedia library center» was proposed.

Key words: Public library, media center, multimedia library, multifunctional space, media technologies, “4 spaces”.

Formulation of the problem

Today the problem of introduction media technologies in the public libraries of Ukraine within the information multifunctional space is poorly studied. There are only publications of world experience and articles translated into Ukrainian by foreign colleagues. Weakly studied is the impact of information technology and social inquiry on the architectural and planning system of the modern libraries, as well as an emergence of a new typology of such buildings. In this regard, it is necessary to study the world experience and the IFLA model of “4 spaces” for its deep knowledge of construction and operation.

Analysis of the research and publications

The question of the study of the architecture and construction of libraries is relevant throughout the world. This is evidenced by the large number of scientific publications. There are the works of L. I. Alyoshin, A. B. Ander, A. R. Anisimova, S. Artamonova, O. Bashun, A. Valchak, V.M. Vinogradova, D. Gavretsky, L. S. Golovina, O. A. Dubinina, E. D. Zhabko, V. V. Zarudka, B. Zeltsle, K. B. Lavrova, I. Lelyuk, A. McDonald, V. Nefedova, Yu. P. Obrosoy, V. V. Kutsevich, AP Patseli, L. O. Stepanova, K. E. Trubetskaya, G. M. Chernenko, I. S. Voronkova etc among them.

Significant theoretical and practical contribution to the development of problems of design and construction of library buildings was made by F. M. Paschenko. Mishkovsky covered the main issues of library

design in his scientific work. He considered the principles of locating a library building in the city. In the late 80's of the twentieth century the scientific works of A. R. Zimonenko and O. V. Anisimov were relevant for library design buildings. A. Zimonenko proposed the concept of mass media optimization libraries by diversifying the visitor's conditions. Instead of this O. Anisimov identified the basic requirements for a spatial organization libraries of higher educational establishments which consisted of communication and information kernel, in the application of multilevel volume, in using free planning and functional zoning.

It is important to note that there are no clear design guidelines for construction and renovation of different kinds of libraries in Ukrainian state building codes according to the 2019. There are no new standardized requirements for the structure and form of library buildings, their design, construction, technical and technological support. Nowadays the architects use regulatory requirements that were designed in the Soviet ages.

Analysis of the scientific literature showed that the questions of renovation, modernization, improving and developing the architectural environment of the libraries of higher education institutions in Ukraine are poorly understood. Scientific papers are mostly fragmentary. They devoid of full-scale examinations, critical analysis the current state of library facilities.

The purpose of the article

As a result of new functions and their dependencies on information technologies and social request in the media centers, currently libraries need new models of activities, which takes into account the problems that society faces and at the same time shows the potential of the library of the future. The "Four spaces" model is a transforming a public library from a passive collection based space to a more active space for experience and inspiration and a local meeting point. This model needs learning and adaptation to Ukrainian realities.

The Presentation material

The development of the information society requires revision of the position and value of the institutions, which work with information, knowledge and culture. By the way, the impulse for reconsideration and development of libraries in the European community was a resolution, issued in October 1998 by the European Parliament, "The role of libraries in modern societies" (Ryynänen, The role of libraries in modern society, 1999). It was the first document on EU library policy. It identifies the needs for the most important pan-European action in the libraries.

According to the document, libraries have been identified as one of the key elements of open access to information, which is crucial for the development of a democratic information society. The following paragraphs of this resolution testify to the first stages of rethinking the role of libraries in contemporary society and adapting it to the needs of the local community.

"Given that the best of public libraries also serve as a central social forum for the local community, where a lot of activities of the local community can be brought together and contribute to community development" (Ryynänen, 1988).

"The traditional image of the library is that it is a place where books are kept, but in modern-day society this is no longer accurate. Libraries may – and should – contain all media suitable for use at them. The most important access criterion at libraries is the quality of the material. Thus libraries primarily provide content rather than packaging according to particular models. The experience of libraries has been that new media do not supersede old. On the contrary, the various media support one another in the library context" (Ryynänen, 1988).

Currently, partly due of the publication of the document mentioned earlier, libraries have changed their appearance and added new functional areas.

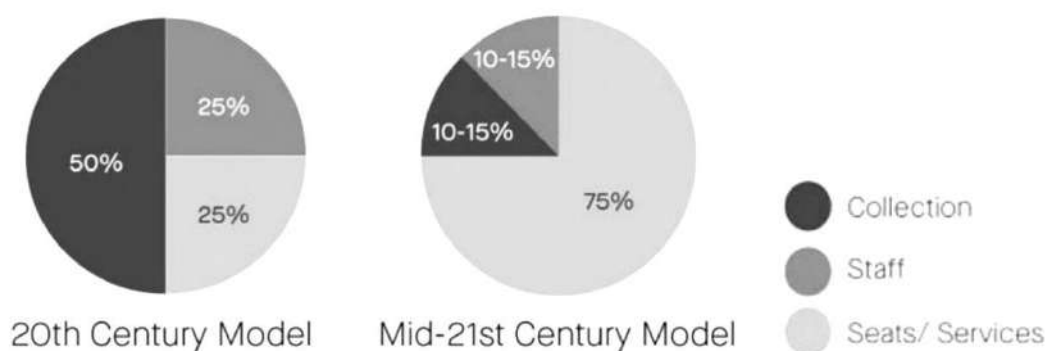


Fig. 1. The evolution of libraries. Zone ratios chart. Twenty-first century library space allocation (graphic by Shepley Bulfinch) (3)

The space in the library is divided into 3 main groups: funds, administration and the public part. The proportional ratio of the areas of these spaces has changed significantly compared to last century.

According to the schedule presented in Fig. 1, the area that used to hold funds in a typical library of the 20th century has nowadays decreased from the half of the total area of the library to 15 %, and so has the area reserved for administration decreased from 25 % to 15 %, which has allowed the public space to increase to 75 %. (Koen, D., Lesneski, T. E., 2018)

In addition to traditional library functions and modern information technologies, a social and public functions are also required for the effective functioning of the library. Recently, it has become necessary to form a new paradigm of the information society, in which the role of the library has changed, and directly the reader-library interrelation is transformed into a simplified “user-library”. It should also be noted that the word “reader” has disappeared from official documents, it is recommended to use “consumer”, “user”. In the new model: “in the work of libraries the transition marks from the paradigm of influence to the paradigm of interaction with readers, users and visitors”. Also, the basic notion is the desire not to rebrand the existing standard library (change of visual design, name), but to create a new model of the library (Gushul, Y. V., Kozhenkin I. A., Lavrova K. B. 2013).

The Media Library is a multifunctional community complex that combines information and technology functions of a media object, educational and cultural and educative functions of a public library and social functions related to the local community, communicative and recreational space. The Media Library solves the problem of optimal interaction of information technologies and human, adaptation of the human being in the information environment and development of the cultural-genetic code of man and society (Fig. 2).

Research results

A comparative analysis of the education systems of the Scandinavian countries has led to the conclusion that the reform of the education system has touched all levels, based on common educational standards, universality and the widespread introduction of modern e-learning technologies in which libraries are not the last. The models of education systems in Finland, Sweden and Denmark are effective in the market for educational services, use advanced innovative experience, and acquire key competences related to lifelong learning (Tropnikova 2017).

Based on the analysis of world experience, we can conclude that the architectural and spatial solutions of libraries are significantly different from each other. They vary in a scale and number of their large and small functional spaces. However, most libraries, regardless of size and layout, have the same functional areas. The main functional areas of the modern library include the following preserved

traditional, but transformed according to the requirements of the present: entrance group, administration, funds, children's area; and contemporary areas: a common public area, a researching space, a study space, a workshop space.

One of the most important tasks of a library designer is to ensure effective interaction between these different zones. Most often, functional areas are interconnected due to public space. (Fig. 3).

The four-factor model for space functional purpose is used to build new libraries, modify existing libraries, and design the interiors of individual library spaces. Ever since the model was launched, it has played a special role in embodying the concept of a space for creation – which describes the library as a space for creativity, innovation. The four-dimensional model is used not only in Denmark but also influences international library design trends. As is evident, the model embodies four common goals for the public library: Experience, Empowerment, Involvement and Innovation. Two of these goals – experience and empowerment – clearly refer to classical library values such as education, cultural educative and social mobility. Other goals, that is, involvement and innovation, are more focused on new values related to concepts such as social capital, community cohesion, and empowering users to cope with today's ever-changing world (Jochumsen 2016).

Below are four different model spaces (Fig. 4). The four spaces beneath should be seen as intentions according to certain rooms in the library. One physical room can have more than one spatial intention. At most libraries, four spatial intentions coexist – outworked and mixed in different ways: learning, experiencing, meeting and creating.

Learning space is the space where children, youngsters and adults can discover and explore the world and thereby increase their competences and possibilities through free and unrestricted access to information and knowledge. The library is a space for non-formal learning, as well as a space that facilitates formal schooling. In recent years, the emphasis on the library as a learning space has increased. This is due to the development of digital technologies and increased global competition, which underscores the importance of lifelong learning.

“The learning space” is based on discovering and learning something new. It offers, for example, informal learning courses, e-learning facilities, talks, access to knowledge resources and question & answer services. This creates special requirements for “learning space”. The strength of the library as a learning space is that learning becomes a dialogue-driven process, based on personal experience of users and learning needs in the informal space. It is an activity that typically requires retention of attention to a shared task. It also poses demands on equipment, PCs and work tables. It can therefore be an obvious choice to allocate such activities to secluded, semi-closed spatialities. In addition to providing access to analogue and digital information and knowledge, it is important for the library to facilitate learning by having well-equipped study spaces and group work spaces, while providing space for homework and open courses at the same time.

In addition, libraries should be clearly aware of young people's need for experiential learning through interactive social learning models. The library also needs to live up to an intention of providing a learning space for children, and in this case, it may not be a learning space in the style of an office environment that is needed, but a learning space that can support a more activity-based, playful approach to learning.

“The inspiration space” is based on experience. It will typically offer access to materials including literature, art, films, music, entertainment and games as well as events with artists and similar. At a time where ever more titles become accessible on different virtual platforms, the library's role is to a lesser degree to ensure that visitors find what they need, and to a higher degree that they also find what they did not know they needed. In this connection, it is a great challenge for libraries to guide the many different users efficiently and unobtrusively to experiences and activities that match their needs.

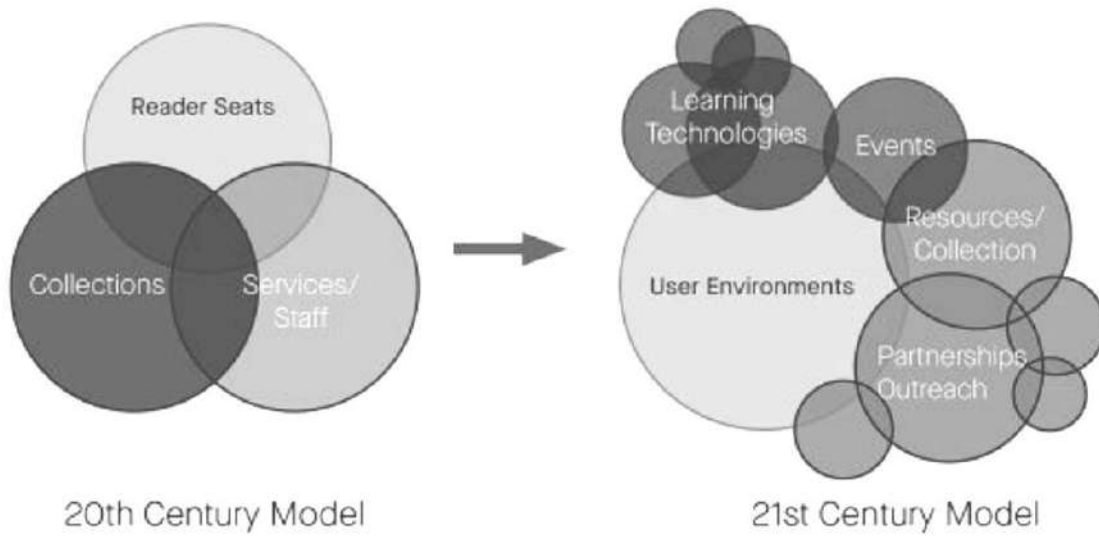


Fig. 2. The evolution of libraries. 50 % of available space is allocated to patrons (graphic by Shepley Bulfinch) (3)

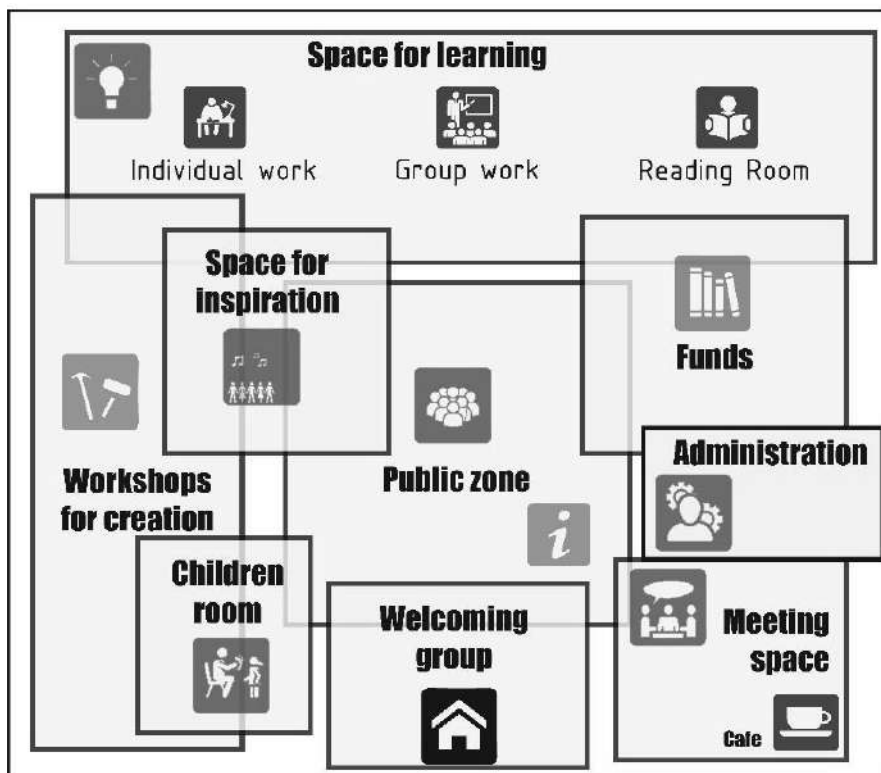


Fig. 3. Interaction of functional zones

Meeting Space is participation-based. It ranges from participating in local political issues, from reading and study circles to local community meetings. Meeting Space creates a space for the development of a passive community, such as library users reading in cafés. Special meetings are held for regular, scheduled events for external users, such as the local youth council. A growing number of libraries have their own café and cultivate architect Jan Gayle's view of engaging “passive communities” – where users prefer to be close to the street and activeness. However, numerous libraries have also decided to move their work or study space to the peripheral areas of the library.

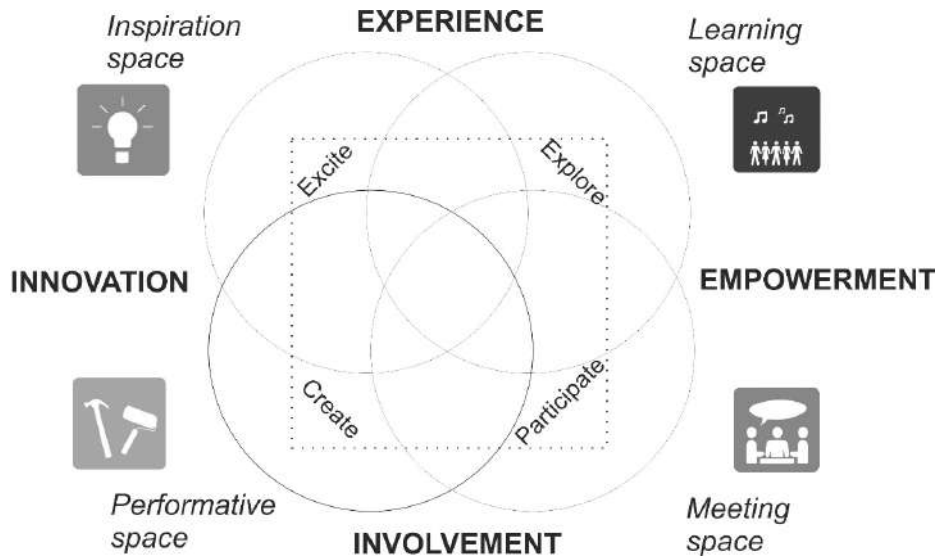


Fig. 4. The four spaces (graphic by Dorte Skot-Hansen, Henrik Jochumsen and Casper Hvenegaard Hansen) (10)

The library as a meeting room is an open, public space where you can meet like-minded people, but more importantly those who have different opinions and views, and discover a different position. The library has always been a meeting place for people, but our multicultural society draws attention to spaces where people's meetings can generate shared understanding and social cohesion. The concept of a “third space», that is, a place that is neither home nor work, often arises when considering the library as a meeting room. Another concept is a “low-intensity meeting place”, which means that it gives us the opportunity to meet people who are different from us, unlike those in our usual fields of activity. The library can maximize its potential for meeting space by focusing on open spaces that facilitate interpersonal interaction – both casual and organized, such as meetings designed to discuss topics and issues. This requires the provision of spaces for casual meetings in small halls, lounge areas with newspapers and cafés, as well as spaces for larger, more organized meetings for public coverage and discussion of news or topics.

“**Space to create**” is based on creatively innovative user-driven activity. It aims at active creation, but this space can also be a creative and aesthetic learning space. It facilitates various seminars: writers' seminars, events with people of the arts, seminars on innovation. Specially equipped workspaces must be provided with space for listening and recording music, compact production laboratories and technologically equipped spaces that facilitate the study and implementation of innovations, and the space should provide safe storage for participants' work. Generally, Creation Space can be used by any visitor to the library. These can be hobbyists looking for equipment, space and new inspiration. Young people are connected to the creative field by looking for places where they can make and present their own creative endeavors, or creative entrepreneurs who need work space and meeting places. What is common about these different types of spaces for creation is that they involve a high degree of user involvement in interior design, workspace equipment and training.

Just as libraries have undergone a process of development “from collection to connection”, we also refer to the “from collection to creation” transition. The library as a space for creation reflects this transition. Users can use the space to create with other users to get inspired and be able to create their own creative expressions or innovative solutions. In the creative space, users can also access tools and materials that support their creative work, and, where possible, they can get support from professional artists, designers, publishers and the distribution of users' work, as well as various events. In fact, the library as a space for creation is not something new, since libraries have previously served as a venue for various seminars. But the new so-called “digital generation” helps ensure that user engagement, user-driven innovation, and the overall transition from passive user to active co-founder are prominent libraries. In particular, the library as a space for creation can be maintained and developed, creating space for various informal seminars or in the form of direct workshops in the library (The Agency for Culture and Palaces n.d.).



Central Library of Gentoft, Denmark.



Copenhagen Public Library in Denmark.



Central Library of Gentoft, Denmark.



Central Library of Herning, Denmark.



Lax Media Library, France.



OODI Helsinki Central Library.



Aarhus Main Library, Denmark.



Vordingborg Library, Denmark.

Fig. 4. Examples of organizing the four functional zones

The general public area, regardless of the size and plan of the solution, in almost all libraries will be a central area for people to stay and a meeting place. This “common square” often has a physical connection between the library's thematic material collections and the specialized premises. The common area is often one of the places in the library that should be able to support the largest number of different activities. It can be a setting for events, theater, reading or music. It may serve as a backdrop for submitting material collections or may include a seating area. It can also be a shared room used by many library users, who are not so much searching for collections as they are collecting or using as a study site.

The most widespread in the common area are the elements such as the stage, showcases and cafés.

A **stage** is another object in public space that needs to be a permanent fixture or can also be easily organized with a quick space adaptation.

Showcases. The second component in the common area may be showcases or digital installations that can support changing exhibitions where the library uses text, images and sound to focus on the author, art form, or time.

Café on the common area. Effective functioning of the café in the common area of the library can contribute to the continued stay of visitors. Especially during large-scale cultural events when the total area was transformed into a stage with seating.

Café may in the first place enhance the function of the library as a meeting room, but it can also cause people to stay a little longer, encourage spontaneous visits, and ideally it can be an open invitation to use other functions of the library. It should accommodate groups of people who talk, rest or work together, as well as individual users.

In this way, the café can help support the library's function as an open space for public meetings where citizens can meet other people in a random context within the library. It is especially important that the café interacts effectively with library stock such as periodicals (The Agency for Culture and Palaces, Model programme for public libraries n.d.).

Conclusion

The modern library has turned from a storage place for books to a multifunctional public space. The study of new features revealed four main functional areas, namely: study space, space for inspiration, space for meeting, space for creation. The overall purpose of these four spaces is to support the following four goals for the public library in the future: experience, participation, empowerment, innovation. It is an inspiration for the use of media, exhibitions, meetings, events, finding information, support for empowerment and education in daily life, personal advisory services. It is a learning space that supports media literacy and general education. It provides a space for user-centric activity and engages users through interactive activities that encourage social interaction and daily living. The Four Spaces model can be used by libraries in many ways. It can be used as a tool for rebuilding an existing library or as a tool for creating new libraries, such as libraries in newly created united territorial communities.

Public libraries promote community development, shape social capital and quality of life in different ways for different groups of people. Public libraries can have a positive impact on the quality of life in the following areas: the state and fundamental human rights, education, leisure and social interaction; not forgetting the role they play in three other areas (economic and physical security, productivity and core activity, health). The development of libraries and library services in accordance with the model of the world space (experience, participation, empowerment and innovation) will help them to create communities that contribute to improving the quality of life of people in their local communities.

The term “Media Library” was proposed and defined. It should be noted that media libraries are beginning to become navigators in an endless array of information, and this sets them apart from other communicative public structures. The basic information function of the public library today is connected not only with providing access to information resources of the society, but also acquiring a resource-evaluation and resource-orientation character. Not only do media centers actively promote the transition of society to the

information age, but also strengthen its democratic and humanistic foundations, and become an important factor in ensuring its sustainable development.

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Тетяна Румілець

МЕДІАТЕКА ЯК ПРОГРЕСИВНИЙ БАГАТОФУНКЦІОНАЛЬНИЙ ПРОСТІР

Анотація. У статті розглянуто еволюцію публічної бібліотеки, сучасні функціональні зони бібліотеки та їх значимість у житті суспільства. Було проаналізовано закордонний досвід розвитку публічних бібліотек. Виявлено, що бібліотека перетворилася на медіатеку під впливом технологій, а згодом, під впливом соціуму, перетворилась на медіа – бібліотечний центр. Цифрова революція привнесла нові методи використання інформації, культурні навички, шляхи комунікації та роботи та нові економічні та законодавчі умови (авторське право). Прорив інтернету 20 років тому змінив основи бібліотеки та парадигма "забезпечувати доступ до інформації" потроху втрачає значення. Зараз існує попит на гнучкість, та здатність бути інноваційним. У публічних бібліотек та медіатек набагато різноманітнішою стала група користувачів та ширші цілі. Головні тренди у нових послугах – це більш активне навчання та соціальна діяльність, заходи з медіа та громадської грамотності, семінари, місце зустрічей, щоденна інформація про життя. IFLA пропонує чотири сценарії бібліотека традиційна, бібліотека "електронна", "Бібліотека як місце подій", "Вітальня громади". Розглянуто модель чотирьох чинників для функціонального призначення простору сучасної бібліотеки. Модель використовується для побудови нових бібліотек, модифікації існуючих бібліотек та дизайну інтер'єрів окремих бібліотечних просторів. Дослідження виявили, що модель втілює чотири загальні цілі для публічної бібліотеки: Досвід, Розширення можливостей, Залучення та Інновації. Запропоновано термін для визначення "медіа-бібліотечного центру".

Ключові слова: публічна бібліотека, медіа-центр, медіа-бібліотечний центр, багатофункціональний простір, медіа-технології, модель чотири простори.

DESIGN OF ARCHITECTURAL ENVIRONMENT

Kateryna Holubchak

**THE SPIRITUAL RETREAT CENTERS –
INNOVATIVE APPROACH
IN THE FIELD OF RELIGIOUS TOURISM:
ARCHITECTURAL AND URBAN PLANNING ASPECTS**

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Abstract. The article contributes to the phenomenon of religious tourism which has gained an increasing popularity throughout the world and caused the emergence of a new type of religious institution – the spiritual retreat centre, which, being a valuable multifunctional social structure, needs deep investigation and further recommendations on the choice of the territory for its location in the planning structure of cities and in the general network of such institutions. The article sheds light on the typology and the basic urban planning principles of their formation in the case of Western Ukraine, as the territory of largest spread of the Greek Catholic Church.

Key words: spiritual retreat centre, religious tourism, urban planning principles, architectural organization.

Problem statement

The rapid pace of development in all spheres of modern society requires a quick response to the complex philosophical and sociological questions of the modernity. Moral and spiritual values, while remaining intact, must be adequate in form to the requirements of the times. Gaining independence by Ukraine has significantly influenced the activation of the spiritual life of society and the revival of the Ukrainian Greek Catholic Church. As a result, the construction of new temples and monasteries, centres of spiritual education has accelerated. The rapid development of the spiritual life of society has led to the need in the new type of institution – the spiritual retreat centre, able to combine many functions, to provide a proper spiritual and educational environment that would satisfy the needs of the parishioners, pilgrims and tourists, and contribute to the formation of deep religious consciousness and spirituality.

However, the development of religious tourism infrastructure in Ukraine is at a very low level. Most sacred sites and potential territories for the construction of spiritual retreat centres are isolated and are not organized properly for the needs of tourists and pilgrims, which significantly reduces their spiritual potential, social and consumer value. And this in turn caused the neglect and destructive status of valuable historical sacred objects. As a consequence, most of these sites were outside the field of view of tourists due to the

number of objective reasons – the lack of organized transport entrance, the loss of historical significance of the site and the lack of recreational areas nearby. Thus the formation of the innovative spiritual institutions at the crossroads of tourist routes is intended to save this situation. This will not only promote the development of religious-tourist infrastructure, attract new tourist flows, but also will fill the content of religious tourism with new spiritual and educational sense.

On this basis, it is necessary to develop theoretical base and give practical recommendations on the design and choice of the territory for the construction of spiritual retreat centres, which at this stage embody the spiritual development of society and is a new perspective direction in the development of sacral architecture.

Analysis of recent research and publications

Recently the phenomena of religious tourism and pilgrimage being one of the least investigated areas in tourism research has gained an increasing popularity and interest among researchers. According to the views of a number of scientists the concept of “religious tourism” can be interpreted, as a mixed combination of secular tourism and pilgrimage (Tan, 2018 pp. 283–309). The motivations of a great number of religious tourists are not limited to visiting temples and sacred sites but also can be expanded to participating in religious activities, worship and other acts, typical for pilgrims (Marine-Roig, 2015, pp. 25–37). Nowadays the original meaning of pilgrimage has changed and got some typical tourism features like use of accommodation infrastructure, transportation, participation in different tourist attractions (Giuşca, 2018, pp. 225–238).

In order to understand the current state, challenges and opportunities of religious tourism in Ukraine a deep review of Ukrainian scientists works in this field should be conducted, taking into account a number of aspects such as the historical-cultural and religious dimension, economic, architectural and other aspects. The study of Ukrainian pilgrimage, the general state of religious tourism and the problems of its development are being undertaken by such scholars as T. Bozhuk (2013, pp. 70–74), O. Shablii (2001, pp. 28), V. Shykerynets (2012, pp. 241–246) and others.

Ukrainian scientist V.V. Shykerynets (2012, pp. 241–246) has clarified the relevance of the use and preservation of historical and cultural heritage as a resource base for religious tourism. He also identifies the religious tourism as a powerful condition of territorial development and prosperity.

Particular attention should be paid to the use of territories with valuable historical, cultural and sacral meaning. In particular, the problems of territorial sacral systems were studied by O. Shablii (2001, pp. 28–32), who substantiated their structure consisting of a functional nucleus; a set of religious infrastructure institutions and enterprises; a set of institutions and enterprises that perform peripheral functions at the core of the system; set of institutions for management of religious life and activity. Russian researcher T. Hristov uses the term “religious tourism industry” to mean “an aggregate of hotels and other accommodation facilities, transportation facilities, catering facilities, various religious sites, and organizations providing tour services and interpreting services”. In the structure of religious tourism, he distinguishes four sectors: “Accommodation”, “Food”, “Transport” and “Religious sites” (Bozhuk, 2013, pp. 70–74).

The investigation of the architectural-urban context of the development of religious tourism is of particular relevance in this study. There are currently very few scientific works devoted to the complex study of the architecture of the spiritual retreat centres and, in particular, the urban features of their formation. A thorough study of architecture of the spiritual and educational centres was carried out by O. Barantseva (2014). The author determines the main factors for the formation of a new architectural object - the spiritual centre and the principles of its formation in urban environment. The principles of zoning and peculiarities of composition of the territory of spiritual centres and functional composition of the premises of these structures are revealed in her research (Barantseva, 2014, pp. 98–114).

The main principles of arrangement of temple complexes in the structure of settlements, as well as features of their location and compositional role in modern urban planning conditions are presented in the scientific work of Yu. Saratovskaya (2000).

A comprehensive study of the issues of architectural-planning and town-planning organization of spiritual retreat centres are presented in the author's dissertation (Holubchak, 2018, pp. 168–189).

However, there is lack of comprehensive consideration of the current state of religious tourism in Ukraine in the scientific literature, in particular in the context of infrastructure, architectural and urban planning aspects, which creates an urgent need for such research.

Objective of the article

The paper aims to make the assessment of the religious tourism potential in Ukraine and to provide a model for its development by creating network of spiritual retreat centers as key attracting points on the tourist routes in the general system of spiritual, cultural and leisure establishments, which will definitely lead to the expansion and improvement of the existing religious and tourist infrastructure.

The goals of the study can be achieved by the following steps:

- The analytical overview of the world experience of architectural and urban planning organization of the religious tourism;
- the analysis of the current state of the religious tourism in Ukraine, defining the main opportunities and challenges;
- the formation of the number of principles and recommendations on the development of spiritual retreat centers network on the territory of Western Ukraine.

The main achievements presented in the paper are based on author's personal experience, who has participated in a number of pilgrimages and religious activities as well as designed a number of spiritual retreat centers in Ukraine.

Results and discussions

The 21st century – the era of spiritual revival and the time of mass pilgrimages to Ukrainian shrines, opens up new opportunities for the formation of moral values, historical and cultural traditions. Against the background of religious-spiritual indifference and moral degradation of society, the need for close unity of man and church life is becoming more urgent. Having a high level of trust among Ukrainians, at the present stage, the Church is an important component of Ukrainian society. Therefore, religious tourism is currently one of the most popular types of tourism in Ukraine. Travels through sacred heritage sites and valuable holy territories possess powerful communication and educational features.

Thus the formation of proper religious-tourist infrastructure, which takes into account innovative foreign approach and standards, is gaining significant meaning. The present stage of the development of sacral architecture is characterized not only by the need to preserve and restore existing temples and monastery complexes, but also by the need to saturate them with new social functions that go beyond worship. Accordingly, the structure of modern temples is changing as well, which envisages the expansion of the nomenclature of social, spiritual and educational purposes. The existing buildings of temples and monasteries are being reconstructed and upgraded to expand their range of activities.

To this end, the need for the creation of new sacral objects – spiritual retreat centers, which aim to widen the range of religious, cultural, educational and recreational activities of the church, in order to meet the new needs of modern society and thus to raise the level of religious tourism industry – is becoming increasingly urgent. These buildings are represented in their wide typology – parish and spiritual centers, small retreat houses and huge pilgrimage complexes. Therefore, there is a need to form a whole network of such centers in the structure of each settlement.

However, the significant problems of the material base of religious tourism in Ukraine, lack of profound academic research in this area as well as the need to identify the main trends in the design of the studied objects, their functional and urban planning features causes the need to consider in detail the world experience.

The popularity and necessity of spiritual retreat centers for modern society is confirmed by many years of successful experience of functioning of these structures in the countries of Europe and America.

One of the first ideas to create a multifunctional church was supported by the American architect Frank Lloyd Wright in his project of the Uniate church complex in Madison, USA (1951), which has become an important architectural and urban planning innovation (Fig. 1). The temple complex, apart from liturgical premises, houses a Sunday school classes, banquet hall. In 2008, at the request of the Madison Uniate Community, the TKWA Architectural Bureau completed a modernized expansion of the church complex caused by the mass flow of tourists and the growth of the church community (Archdaily, 2019). The new building contains a large hall for 500 people, administrative premises, dining room, hall for choral singing. The modern addition completely reflects the idea of Wright's organic architecture and in conjunction with the existing church creates a single whole that harmoniously coexists with the environment. Gradually, the integration of various social functions in cult buildings has become widespread in world practice.

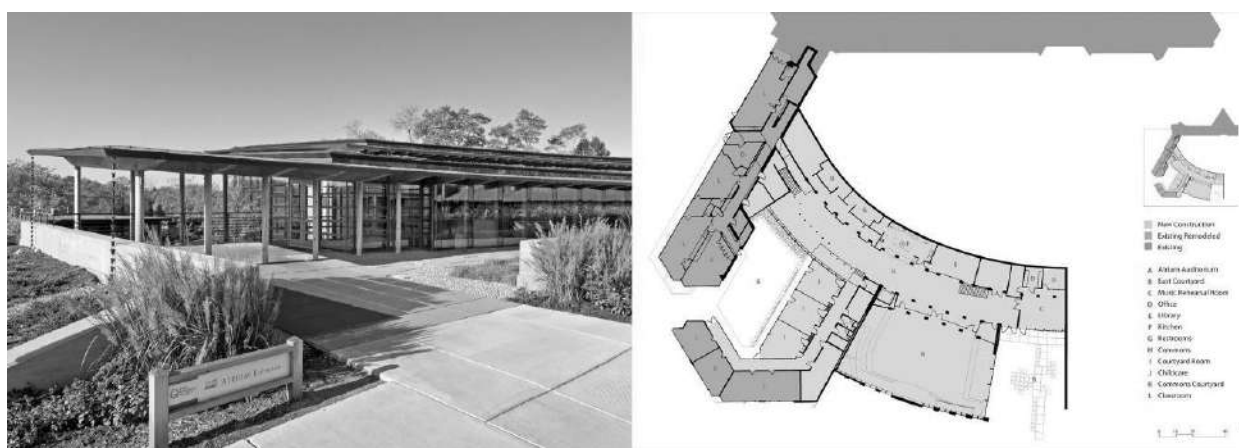


Fig. 1. The project of the Uniate church complex in Madison, USA.

Source: Archdaily, 2019

Another modern example is the project of architect Renzo Piano – a pilgrimage center and monastery in Ronchamp, on the territory of the modernist church designed by Le Corbusier (Fig. 2). The project illustrates an attempt to turn a small pilgrimage center into a powerful tourist destination. Due to the increasing number of visitors to Ronchamp, there is an urgent need for a proper organized area around the church for the needs of pilgrims and establishing a monastery for local nuns (Dezeen, 2019). The complex provides twelve cells with a winter garden for nuns, public places for pilgrims, oratories and rooms for meetings and accommodation for visitors.

The tendency of building spiritual retreat centers is gaining popularity in Ukraine during the last few decades. The good example of a modern pilgrimage center, being at the final stages of construction, is the Goshiv Pilgrim House in Ivano-Frankivsk region. The original architectural proposal designed by O. Mykulyak project reminds the ancient monastic settlements carved in the rocks. The functional planning of the building is designed to meet all the needs of visitors and to realize the social functions of the church. The two-storied pilgrimage center will house living rooms, administrative premises for the clergy, conference rooms and recreational facilities.

Thus the main condition of the formation of the spiritual retreat centers and religious-tourist routes in Ukraine is powerful historical and cultural potential. The priority is given to temples, monasteries, chapels and other places of preservation of miraculous icons, healing springs, relics of saints or other valuable relics, which are of particular attention and interest among pilgrims and religious

scholars. The sculptural and art works of religious subjects, as well as the unique sacral architecture are of particular value.



Fig. 2. The pilgrimage center and monastery in Ronchamp, (architect – Renzo Piano). Source: Dezeen, 2019

However, the analysis of the current state of the spiritual retreat centers network has revealed a number of significant shortcomings:

1. Shortage or complete absence of establishments of this type in potentially important places (territories of pilgrimage centers, key points of religious-tourist routes, etc.) and low-developed infrastructure.
2. Uneven and disproportionate distribution of the spiritual retreat centers in the structure of the region.
3. Absence of general urban planning concept for creation of the network of spiritual retreat centers in the territory of Western Ukraine.

Therefore there is a raising need in proper urban planning strategies for creating a network of spiritual retreat centers throughout the Western part of the country.

The territory of Western Ukraine, with its thousands of priceless monuments of temple architecture and valuable sacral art, is one of the most perspective for the development of the religious tourism industry. The level of spirituality and religiosity of local inhabitants occupies the leading position in Ukraine.

In general, according to the sociological surveys of the Razumkov Center (RISU, 2019), the indicators of the religiosity level of the population of Western Ukraine are significantly higher than those of the rest of the territory. The level of religiosity has a distinct regional character: the number of respondents who consider themselves to be believers varies from 91 % of residents of the Western Ukraine to 56 % – residents of the Eastern Ukraine. The formation of the governing structures of the Church is almost over (Fig. 3).

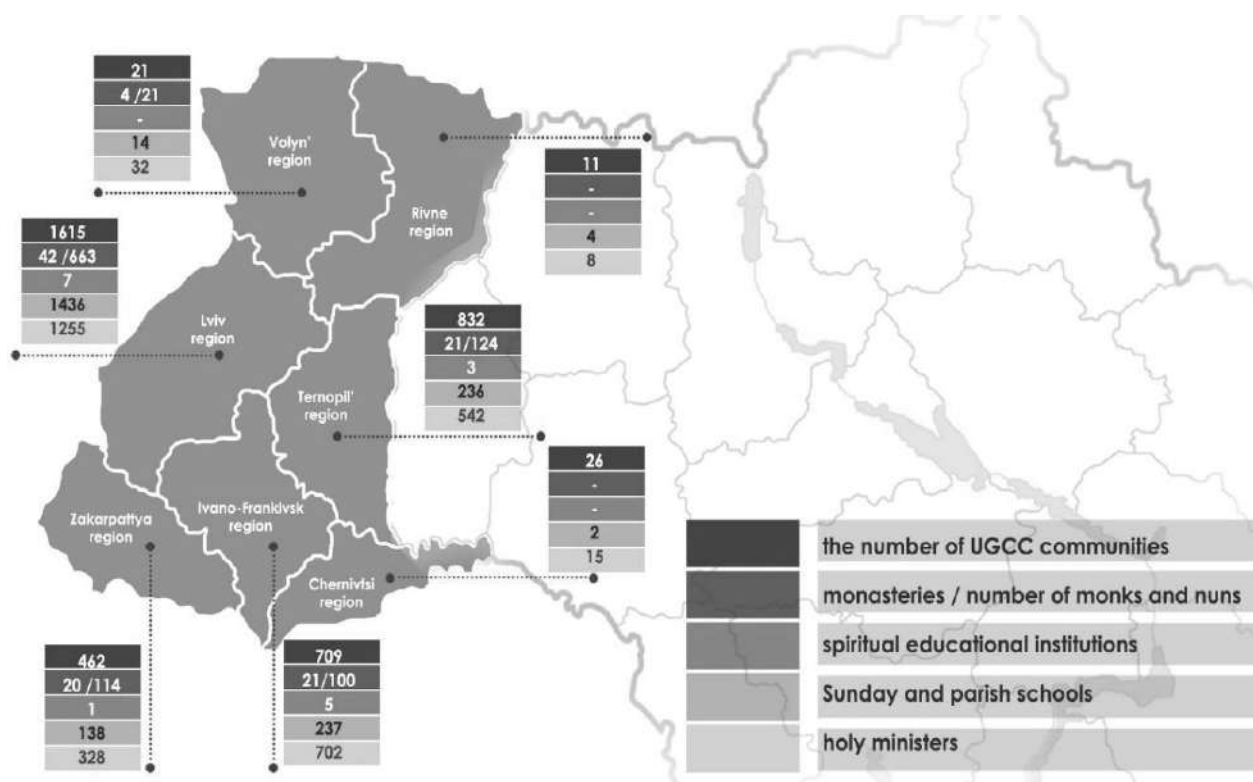


Fig. 3. Network of religious organizations of the UGCC in the territory of Western Ukraine, as of January 1, 2019 (Source: own elaboration based on: Religious organizations in Ukraine (2019))

As of the beginning of 2019, there are 3394 UGCC religious communities registered. Believers are tutored by 350 spiritual centers and administrations, and clergy are taught in 17 spiritual schools. Monastic life is reviving – as of 2019, 102 monasteries of the UGCC operate in Ukraine (RISU, 2019). In addition, there are 2002 Sunday schools and catechism centers for parishes.

Thus, the statistics show that the institutionalized network of denominational-church organizations serving the religious needs of believers has already been established. Besides the regions of Western Ukraine have an inexhaustible amount of sacred resources, which is a great foundation for the development and prosperity of the spiritual and religious tourism sphere. However, the network of institutions dedicated to the implementation of all social processes of the Church – educational, leisure, recreational – remains underdeveloped. Therefore, the question of feasibility of establishing a regular network of UGCC spiritual retreat centers in the Western region of Ukraine is very urgent. That is why a significant reform of the network of tourist sites and infrastructure of sacral structures should be done, involving their potential and the richness of available landscape and recreational resources, and relying on a rich and successful experience of functioning of this type of structures abroad.

There are a number of factors that in one way or another affect the choice of territory for the construction of the building, and which actually determine the potential of it:

1. The decision of the UGCC's administrative and territorial structures (archdiocese) on the expediency of the construction of the spiritual retreat centers, due to their importance not only for the parishioners, but also for the clergy and monks with a purpose of deepening their spiritual education, conducting theological conferences, church meetings.

2. Architectural and urban planning – the structure of the settlement, the relationship with the network of institutions of this type, the required shape and area of the site, capacity and size of the structure.

3. Natural-ecological – ecological condition and comfort of the territory (clean air, satisfactory sanitary and hygiene standards and insolation).
4. Historical-architectural and sacral context (the availability of a certain resource base for the formation of an institution; the sacral core of the territory – a temple, monastery, miraculous source or icon).
5. Landscape-geomorphological – the form of existing relief, the presence of water (rivers, springs, lakes) and natural (mountains, valleys, forest plantations) components.
6. Engineering communications – the availability of access or the possibility of laying important engineering communications (water, gas, electricity, telephone and Internet communications).

When choosing the potential location, the presence of the sacral nucleus, or the possibility of creating it on the territory should be taken into account. Therefore, in order to formulate recommendations for the improvement of the system and design of specific types of spiritual retreat centers on the territory of Western Ukraine, it is important to dwell on the study of the current state of the sacral-spiritual infrastructure and architectural typology of spiritual centers, as well as to identify its features, advantages and disadvantages. With this aim the cartographic presentations for existing situation has been made. The cities of Western Ukraine with their significant religious and tourist potential provide all the necessary conditions for the creation of a whole network of such religious and spiritual centers in different corners of the region and at various sacred institutions. An analysis of the territories with significant potential for the formation of spiritual retreat centers is presented in Fig. 4. These schemes indicate the territorial distribution of the most significant shrines in Western Ukraine – monasteries, pilgrimage centers with miraculous icons, especially valuable masonry and wooden temples. Particular attention should be paid to: the distribution of these objects on the territory of Western Ukraine, their pedestrian accessibility, the scale of new construction in order to form a network of spiritual retreat centers throughout the territory of Western Ukraine.

Thus, the territory of Western Ukraine has an inexhaustible amount of sacral resources, which forms a favorable foundation for the development and prosperity of the religious tourism sphere.

Based on this analysis, the proposals of establishing the spiritual retreat centers network in the Western Ukraine have been made (Fig. 5) The scheme shows three variants of perspective location of spiritual retreat centers by three types – parish centers, retreat centers and pilgrimage centers.

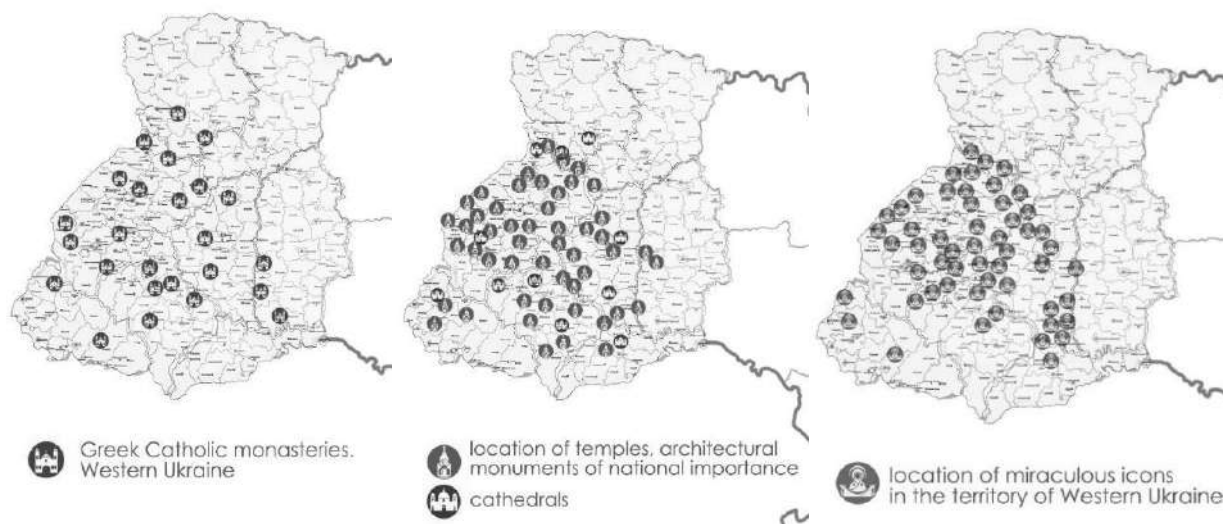


Fig. 4. Map of the shrines of Western Ukraine. Monasteries Temples, Miraculous Icons, UGCC.

(Source: own elaboration based on: Interactive map of UGCC (2019))

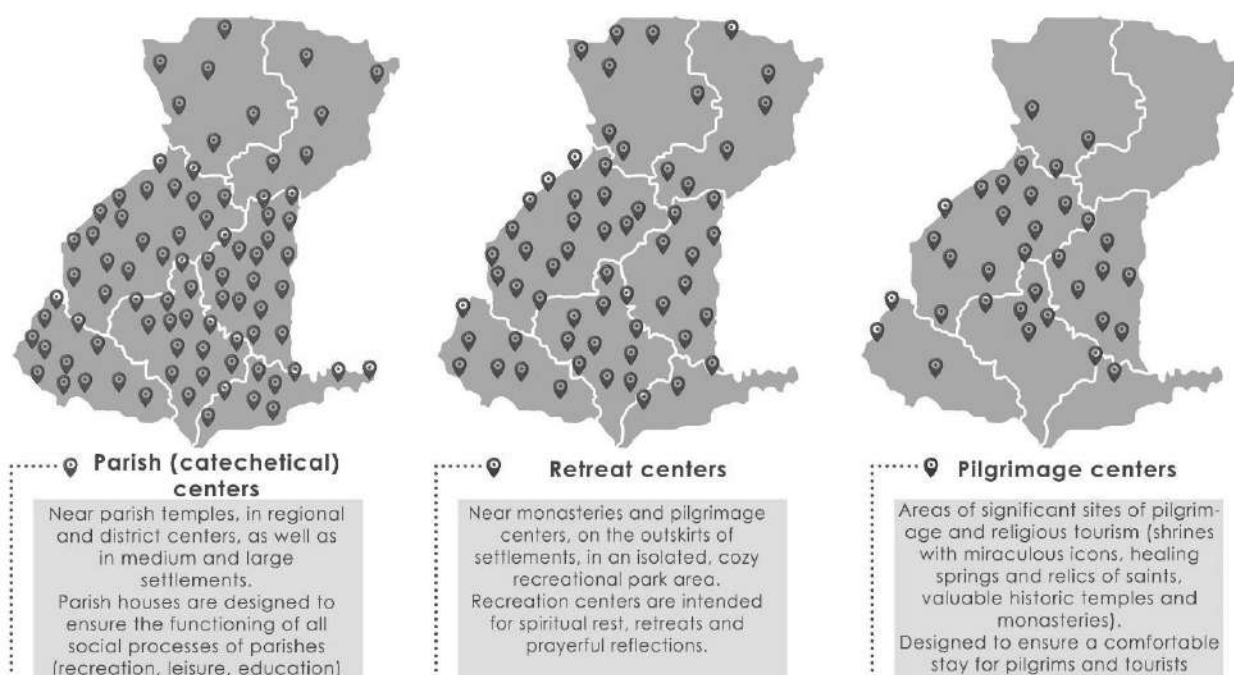


Fig. 6. Perspective locations of the three types of spiritual retreat centers (on the example of the Western Ukraine regions). Source: own elaboration

Thus, the urban factor is decisive in the formation and development of the network of spiritual retreat centers and their location in the city structure, which depends on several important prerequisites:

- the type of settlement, its planning structure, density and demographic composition of the population.

When selecting the territory for the spiritual retreat centers, as well as forming their network, it is important to predict their location at important functional nodes (at the intersection of tourist routes, recreational territories or in important functional structures of cities);

- the presence of a sacred institution (temple, monastery);
- convenient transportation and pedestrian accessibility and the possibility of further development of the territory (Holubchak, 2018, pp. 118–120).

In addition, we can define the following principles that underlie the creation of a network of spiritual retreat centers:

- compliance – the objects are located in accordance with the concentration of sacral-tourist resources;
- selectivity – the network is formed on the basis of historical, architectural and sacred heritage;
- specializations – spiritual retreat centers are considered in the system of sacral-tourist routes with the involvement of cultural and spiritual traditions of the territory;
- stages – the gradual filling of the territory with spiritual content (Fedorova, 1998, pp. 123–124).

All of the above proves the invaluable potential of the study area, which should be actively used in the formation of a network of spiritual retreat centers.

Conclusions

Therefore, at the heart of the formation of spiritual retreat centers and the development of the religious-tourism industry in Ukraine is its rich spiritual, cultural and historical patrimony, which is presented by majestic architectural ensembles, archaeological monuments, historical rural and urban areas, religious art values and traditional features of each region.

The profound analysis of the sacral heritage of Western Ukraine has allowed to establish the main rationalization directions of its use:

- carrying out preservation and restoration measures for the sacred objects;

- preserving traditions and attracting the attention of the young generation through holding religious festivals;
- enrichment of the attractive program of pilgrim tourism with a wide range of cultural activities and traditional crafts;
- development and implementation of state programs for the development of pilgrim tourism in the studied region;
- organization of advertising campaign and worldwide promotion of the Western Ukraine regions as important spiritual centers.

The territory of Western Ukraine with its significant religious and tourist potential provides all the necessary conditions for the creation of a whole network of such religious and spiritual centers at various sacred institutions, which will become a powerful dash in raising the sphere of religious tourism to the new level. The functioning of such establishments will fill the content of the religious-tourist branch in Ukraine with a new spiritual and educational sense. Spiritual retreat centers, which have been successfully functioning for decades at well-known pilgrimage centers and parishes in the world, could become the key to our nation's spiritual revival.

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Катерина Голубчак

**ДУХОВНІ-РЕКОЛЕКЦІЙНІ ЦЕНТРИ –
ІННОВАЦІЙНИЙ ПІДХІД
У СФЕРІ РЕЛІГІЙНОГО ТУРИЗМУ:
АРХІТЕКТУРНО-МІСТОБУДІВНІ АСПЕКТИ**

Анотація. У дослідженні висвітлено феномен релігійного туризму, який набув особливої популярності у всьому світі та спричинив появу сакральної інституції нового типу – духовного реколекційного центру, який, будучи важливою багатофункціональною соціальною структурою, потребує глибокого дослідження та подальших рекомендацій щодо вибору території для проєктування та його розташування у планувальній структурі міст та в загальній мережі закладів такого типу. Теоретичним підґрунтям для сформованих рекомендацій є ґрунтовний аналіз світової та вітчизняної практики архітектурно-містобудівної організації релігійного туризму.

У статті висвітлено типологію та основні містобудівні принципи їхню формування на прикладі Західної України, як території найбільшого поширення греко-католицької церкви. Дослідження має на меті здійснити оцінку релігійно-туристичного потенціалу Західної України та сформувати модель його розвитку шляхом створення мережі духовно-реколекційних центрів як ключових пунктів на перетинах туристичних маршрутів у загальній системі духовних, культурних та дозвілєвих закладів, що, безумовно, призведе до розширення та вдосконалення існуючої релігійно-туристичної інфраструктури. Основні досягнення, представлені в роботі, засновані на особистому досвіді авторки, яка неодноразово брала участь у низці паломницьких та релігійних заходів, а також є автором низки проєктів духовних реколекційних центрів в Україні.

Ключові слова: духовно-реколекційний центр, релігійний туризм, містобудівні принципи, архітектурна організація.

CONSERVATION OF ARCHITECTURAL AND ARTISTIC HERITAGE

Oleh Rybchynskiy¹, Olena Fomina²

**CAUSES OF DESTRUCTION
OF ARCHITECTURAL DETAILS MADE OF ALABASTER STONE.
(FOR EXAMPLE, THE GOTHIC CHURCH IN DROHOBYCH)**

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Abstract. The article presents a detailed description of the conservation state of the unique gothic alabaster portal of the parish church in Drohobych. It also defines the position of the portal in the plan of the church. The main reasons and consequences of the deterioration of the alabaster stone are established. The article studies and supplements the historical background on the portal's foundation and the changes that arose during the reconstruction in the twentieth century. According to the results of the carried out researches (microanalysis, visual observation, comparison), this article establishes a deposit from which the stone was supplied for the construction of the portal. Microanalysis of the selected samples showed the alabaster's structure and type, natural process of the dissolution of alabaster crystals, components of cement mortars.

Key words: alabaster, portal, parish church, Drohobych, deterioration, reasons, consequences.

Problem Statement

The issue of the article deals with the existence of the unexplored and unrecorded state of the gothic alabaster portal of the parish church in Drohobych, which is a unique example of using alabaster in exterior. Considering the physico-mechanical features of the stone, the portal preserved, despite the recurrent destructions of the church and adverse weather conditions. The existence of the gothic alabaster portal itself requires the close attention of researchers and restorers. The given object needs a detailed research of the reasons and the consequences of deterioration, in order to preserve the artistic heritage of two nations – Ukraine and Poland. This research will lead to the study of the restoration issues and the development of a technological scheme of alabaster restoration in the exterior.

Analysis of researches and publications

The works of such researchers as T. Zaucha (Zaucha, T, 1998), M. Mściwujewski (Mściwujewski, 2018), F. Gałkiewicz (Gałkiewicz, F. Z., 1906)], E. Solecki (Solecki Ostoja, E,L, 1884–1885), T. Trajdos

(Tadeusz, M., Trajdos, T. M., Zaucha, T., 2001) and others give the information about the gothic alabaster portal of the parish church in Drohobych.

F. Gątkiewicz (Gątkiewicz, F. Z., 1906) and E. Solecki (Solecki Ostoja, E. L., 1884–1885) are one of the first researchers of the church, who give a short description of the alabaster portal general appearance and its conservation state. The writings of T. Zaucha (Zaucha, T., 1998) and T. Trajdos (Tadeusz, M., Trajdos, T. M., Zaucha, T., 2001) are the most structured and informative in the context of architecture and decoration of the church, although the description of the portal is concise. Buczek M. and Sodelnyk I. (Buczek, M., Sodelnyk I., 2008) entirely refer to the book of T. Zaucha. However, M. Mściwujewski outlines the background to the building of the alabaster portal and considerably supplements its description.

The works of V. Halyk (Galyk, 2017), M. Mściwujewski (Mściwujewski, 2018), T. Trajdos (Tadeusz, M., Trajdos, T. M., Zaucha, T., 2001, p.101), W. Walczak (Walczak, W., Lopatecki, K., 2013, p. 318), E. Solecki (Solecki Ostoja, E. L., 1884–1885) contain the depiction of the portal in photographs and drawings, the general appearance of the southern side of the church with a view to the portal, as well as the plan of the church and the map of its location.

The alabaster portal of the parish church has not attracted enough attention of the researchers. The analyzed publications do not state the deposit of the portal alabaster and do not inform about the changes that arose during the reconstruction. The authors included only the short descriptions of its general appearance. The absence of the profound information is the reason for the detailed study and supplement of the facts about the unique gothic portal of the parish church in Drohobych.

The aim of this study is to define the reasons and the consequences of the deterioration of the gothic alabaster portal of the parish church of St. Bartholomew in Drohobych.

Main research material

The parish church in Drohobych was built in 1392 and consecrated to the Assumption of the Virgin Mary, Holy Cross and Bartholomew the Apostle. The church is located on the southwestern side of the Market, on a spacious square planted with trees. It was constructed of red fire brick with rubble stone in the foundation.

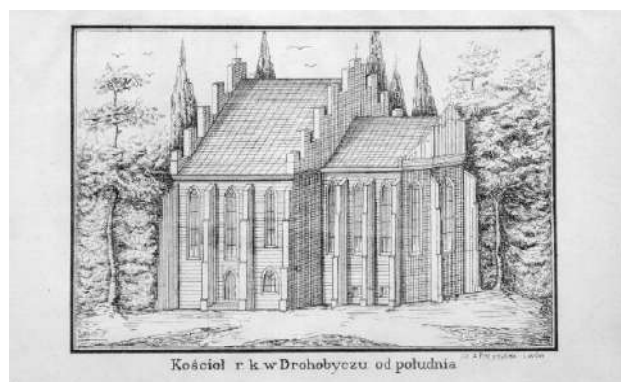


Fig. 1. Solecki E. L. Kościół parafialny rz. k. w Drohobyczu (z 2 ma litografiami) // Rocznik Samborski: nowa serja illustrowana: wydawnictwo na cele dobroczynne samborskie. 1884–1885. – R. VIII. – Przemyśl: Nakł. Gothilfa Kohna, 1884–1885. – S. 133

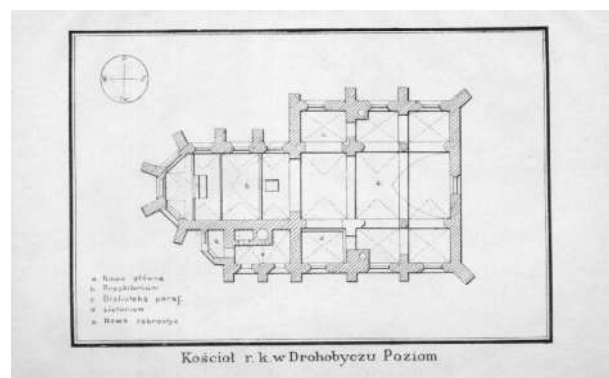


Fig. 2. Solecki E. L. Kościół parafialny rz. k. w Drohobyczu (z 2 ma litografiami) // Rocznik Samborski: nowa serja illustrowana: wydawnictwo na cele dobroczynne samborskie. 1884–1885. – R. VIII. – Przemyśl: Nakł. Gothilfa Kohna, 1884–1885. – S. 137

The gothic alabaster portal is one of the unique architectural features of the church. Its foundation M. Mściwujewski credits with Jan Mężyk (chief – starost – of Drohobych), who supported the building of other entrance portals on the south and north sides of the church. The research of Felix Gątkiewicz gives some facts about the once oak double leaf doors and the poor state of the portal, which was literally falling apart into pieces (Gątkiewicz, F. Z., 1906, p. 9). Today the oak doors are replaced with the metal doors. The photograph taken by B. Lieberman in 1906 before the reconstruction is the visual confirmation of Gątkiewicz's words (Walczak, W., Lopatecki, K., 2013, p. 318] (Fig. 3). In the picture, you can clearly see the damaged lower part of the portal,

now reconstructed from sandstone. Unfortunately, it is impossible to define the authenticity of the reconstruction. You may as well see the elements of the alabaster panels made before 1906. The staircase was laid out of stone and was considerably narrower than nowadays. Information plaques were relocated to the buttresses. There is the surface of plaster with two crosses and coats of arms of Drohobych and Poland above the alabaster portal. M. Mściwujewski poetically unfolds the history of these two crosses origin, which is related to the name of Jan Mężyk (chief – starost – of Drohobych). In the eighteenth century, swords were replaced with crosses; in the center, one more cross, smaller in size, was hewn; the coat of arms of Drohobych substituted the J. Mężyk’s one. According to M. Mściwujewski, Jan Mężyk commemorated the most significant day in his life – the participation in the Battle of Grunwald (July 15, 1410), which the two swords along the edges of the portal symbolize. “Therefore, he decided to tell the descendants about the triumph of the Polish and Lithuanian troops and his own participation in it, and ordered the architect to hew out of stone two huge Teutonic swords over the doors, the coat of arms of Poland and his own, and the inscription: “Hoc templum ineuntes Deus benedict – memento animi” – “Bless God all those who enter this shrine – remember the soul” (Mściwujewski, M. V., 2018, p. 4).



Fig. 3. Drohobych, parish church, south portal.

Photo by B. Lieberman, 1906. Photograph collection of the Institute of the History of Arts UJ (repr. W. Walanus) (Walczak, W, Lopatecki, K, 2013.p. 318)



Fig. 4. Drohobych, parish church, south portal, 2018

Object Description

The gothic alabaster portal is located on the southern side of the Church of Assumption of the Virgin Mary, Holy Cross and Bartholomew the Apostle in Drohobych. Four cemented stairs lead to the portal. A part of the brick wall, situated above the portal, is plastered and painted in light yellow. A cornice, which resembles the curve of the portal, separates the surface of plaster from the portal. The coat of arms of Drohobych and the

Polish Crown are on this surface. Sword-shaped crosses are situated on the both sides of the portal and above in the center of it. There are three crosses. The crosses and the coat of arms are supposedly made of sandstone. The plastered leaf ends with the phrase “Hoc templum ineuntes Deus benedict – memento animi” (Walczak, W., Lopatecki, K., 2013, p. 44). The sandstone pedestal of the church has pyramidal-shaped chamfers on the two sides of the portal. The metal entrance door is in black colour.

The gothic alabaster portal consists of fourteen separate blocks of different size hewn of solid stone. The portal has a pointed arch, semicircular archivolt decorated with the ribs, which interlace in its upper part and have intersecting crossings from one segment to another. There are five ribs in the gothic portal. Molding profile of the ribs resemble an astragal. In the lower part, the bead moldings have a prismatic and curved form. The blocks No. 1, 2, 13, 14 made of sandstone are the result of the restoration work during 1906–1913. The first block is four rectangular bush-hammered planes with fluted arrises. The second block is four square planes which intersect with a ribbed body of the portal and are decorated in the same way as the first block. The level of reconstructed blocks is different. There are pyramidal-shaped chamfers in the lower corners of the portal. The entrance door was situated closer and the portal jamb was much narrower.

State of conservation

The gothic alabaster portal of the Church of St. Bartholomew in Drohobych is in the extremely unsatisfactory condition. Internal, small, large, deep cracks are visible all over the alabaster surface. Mechanical loading causes an increase in their size, depth and quantity. Rain, water, humidity, abrupt air temperature change leads to the formation of furrows, cavities, splits, weathering and stratification of the alabaster. Stratification can be mostly observed on the masonry wall of the church. The stone surface is uneven and loose, covered with black patina. There are also yellow, white and red-orange spots. Cracks, cavities, additions, masonry joints between the blocks, gaps are filled with cement mortar. The additions belong to different periods. A big gap across the plane between the portal jamb and the metal door is also filled with cement mortar. It indicates the fact that the entrance door was much closer. The additions of the jamb are partly green and black. There are also spots of red paint. Cement mortars used during the additions differ from each other by the ratio of binding agent and component composition: brick, sand, gypsum, lime. There are gypsum additions on the portal (gypsum without fillers, gypsum mixed with fibers, found between 7–8 blocks) and gauged mortar (the filler of which is crushed brick) in the joints between the blocks.

Numerous alabaster panels of different size, colour, structure and period of mounting, which were the results of the previous restoration work, are on the portal. The alabaster panels are fixed on the cement mortar. Most of the panels are in the unsatisfactory condition. The keystone of the portal is in a particularly critical condition, as the biggest amount of mechanical loading falls on it.

Detailed description of the conservation state of the gothic alabaster portal

Block No. 1



Four stone rectangular planes, which follow the angle of the portal, are made of sandstone. The surface finish of the stone looks like a bush-hammered plane with fluted arrises. The block was hewn of sandstone.

State: stable

Losses: 90 % of the face finish is lost

Deterioration: weathering, small splits

Cracks: two deep cracks, which can lead to chipping off the substantial part of the block

Contamination: black patina, yellow and white spots, which can cause dampness of the stone

Additions: joints between the blocks and the wall filled with cement mortar. One of the block planes is inserted as a separate slab, which can be a result of the previous restoration work

Block No. 2

Result of the restoration work: Block №2 looks like four square planes with a transition to the corrugated body of the portal. Molding profile of the ribs resemble an astragal. There are six ribs. The bead moldings have a prismatic and curved form. The square planes of the block have a bush-hammered decoration with fluted arrises. The block is hewn from sandstone.

State: satisfactory

Losses: not detected

Deterioration: stone weathering, small splits and cuts

Cracks: one large crack in the stone, which can lead to chipping off the substantial part of the block. The crack follows to the lower part of the block, jointed with cement mortar. Between the cement mortar additions and the stone small cracks appeared, one of which was jointed with cement over again.

Contamination: spots of black and red paint, little orange pots like spots of rust, white smudges

Additions: a gap between the block and the entrance door filled with cement mortar and partly painted in green colour.

Panels: not detected

Block No. 3

Alabaster molding block, consists of five ribs.

State: unsatisfactory

Losses: lower part of the 1, 2, 3 ribs of the portal

Deterioration: on the most part of the stone's surface (80%) erosion caused by wind, water erosion, temperature change can be observed, which resulted into the formation of numerous cuts, cavities, splits, minor and large cracks. Marks of mechanical cleaning of the stone: deep even furrows all over the plane.

Cracks: minor, small, large

Contamination: yellow, red, white spots; spots of black and red paint

Additions: a gap between the block and the entrance door filled with cement mortar and partly painted in green colour. The joints between the blocks and the wall are filled with cement mortar.

Panels: jamb of the portal of yellow alabaster with grey veins

Block No. 4

Alabaster molding block, consists of five ribs.

State: unsatisfactory

Losses: significant part of portal ribs lost its initial form. A part of the third rib is completely lost.

Deterioration: on the most part of the stone's surface (80 %) erosion caused by wind, water erosion, temperature change can be observed, which resulted into the formation of numerous cuts, cavities, splits, minor and large cracks. Marks of mechanical cleaning of the stone: deep even furrows all over the plane.

Cracks: two deep cracks, which can lead to chipping off the substantial part of the block; numerous small and internal cracks

Contamination: there are splashes of black and red paint on the internal side of the portal; green cement addition, black patina

Additions: 11 panels of yellow and grey alabaster. The state of panels is stable. Between the block and the entrance door there is a gap all over the height of the block filled with cement mortar

Block No. 5

Alabaster molding block, consists of five ribs.

State: unsatisfactory

Losses: a part of the yellow alabaster panel chipped off

Deterioration: erosion on the surface of the stone; the surface is uneven and rough, entirely covered with cavities, furrows; there are marks of coarse sandpapering of stone

Cracks: seven large deep cracks, which can lead to chipping off the substantial part of the block. Numerous minor, small and internal cracks.

Contamination: there are spots of black and red paint on the internal side of the portal; green cement addition, black patina

Additions: Six cement mortar additions. Between the block and the entrance door there are a gap, joints, cracks, cavities filled with cement mortar

Block No. 6

Alabaster molding block, consists of five ribs and intersecting crossings to the next block.

State: unsatisfactory

Losses: part of the fifth molding

Deterioration: erosion of the surface of the stone, numerous cavities, cracks, furrows, and the surface is uneven and rough. There are flat horizontal furrows on the jamb of the portal. They are supposedly the marks of the tool, which remained after the stone dressing.

Cracks:

Contamination: there are spots of black and red paint on the internal side of the portal; green cement addition; black patina; yellow, white and orange spots; on the jamb surface of the portal lime or gypsum mortar was detected.

Additions: Between the block and the entrance door there are a gap, joints, cracks, cavities filled with cement mortar. Cement additions are also on the ribs of the portal.

Panels: five alabaster panels

Block No. 7

Rounded block consists of seven ribs. Profile of the ribs has a bead molding shape.

State: unsatisfactory

Losses: not detected

Deterioration: mechanical deterioration – splits, erosion of the surface of the stone, numerous cavities, cracks, furrows

Cracks: three large cracks, which can lead to chipping off elements of the block

Contamination: most of the surface of the stone is covered with yellow spots, splashes of cement mortar; jamb of the block is rubbed with gypsum mortar

Panels: six alabaster panels of different colour

Additions: there is an addition of gypsum and cement mortar on the fourth rib. The crack on the third rib is filled with cement. Between the block and the entrance door there is a gap all over the height of the block, joints

	<p>between the blocks are filled with cement mortar. There is a sample of two kinds of cement mortar with different content of impurities between the seventh and the eighth blocks, which can be a result of the restoration work in different periods</p>
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Block No. 8

Keystone of the portal with intersecting ribs, which create a diamond pattern.

State: unsatisfactory

Losses: part of the ribs at the intersection of the fourth row of ribs

Deterioration: mechanical deterioration – splits, erosion of the surface of the stone, numerous cavities, cracks, furrows; the stone is uneven and rough. There are deep furrows, which can be a result of the mechanical cleaning with metal brushes

Cracks: deep cracks between the alabaster panels and the authentic stone, deep crack on the second rib, which can lead to chipping off most of the block, numerous small cracks.

Contamination: splashes of cement mortar, yellow spots, black patina. Part of the cement additions between the block and the entrance door is in black, red and green paint.

Panels: ten alabaster panels of different colour – yellow, white, grey – fixed on the cement mortar. There is an inserted wood peg between the fifth and the sixth rib, polished as a profile shape.

Additions: cracks, joints between the blocks, a gap between the block and the entrance door filled with cement mortar

Block No. 9

Rounded block consists of seven ribs. Profile of the ribs has a bead molding shape.

State: stable

Losses: small piece of the sixth block is lost

Deterioration: deep flat furrows are cut horizontally on the jamb of the block in a chaotic order; there are also numerous furrows on the surface of the stone, which can be a consequence of the mechanical cleaning with metal brushes. Erosion of the surface of the stone, numerous cavities, cracks, furrows, and the stone is uneven and rough. The jamb of the block is far whiter than the natural colour of the stone, the reason of such state of the stone is unknown.

Cracks: four deep cracks, numerous minor and small cracks. There are also cracks in the cement addition between the block and the entrance door.

Contamination: yellow spots, black patina. A part of the cement additions between the block and the entrance door is in black, red and green colour.

Panels: three alabaster panels

Additions: numerous minor additions of cement mortar on the ribs of the block; also, on the entire surface near

	the junction of the eighth and the ninth block, between the jamb of the portal and the entrance door a gap is filled with cement mortar
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Block No. 10

Alabaster molding block, consists of five ribs and intersecting crossings to the next block.

State: stable

Losses: not detected

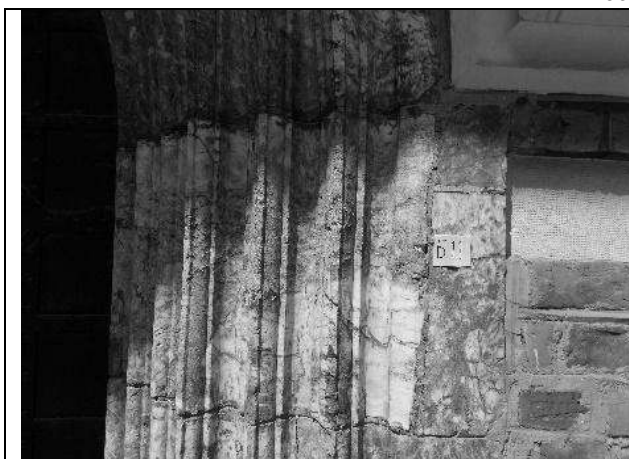
Deterioration: deep flat furrows are cut horizontally on the jamb of the block in a chaotic order; there are also numerous furrows on the surface of the stone, which can be a consequence of the mechanical cleaning with metal brushes. Erosion of the surface of the stone, numerous cavities, cracks, furrows

Cracks: seven large deep cracks (the biggest cracks are on the jamb of the block all over its height, as well as between the first and the second ribs over the block's height), numerous small and big cracks, which can lead to destruction and chipping off part of the block.

Contamination: yellow spots, black patina, a part of the cement additions between the block the entrance door is in black, red and green colour

Panels: four alabaster panels of different colour – yellow, green, white

Additions: cement additions on the ribs of the block near the junction of the eleventh and the tenth blocks over its breadth; all ribs in the lower part are supplemented with cement mortar, also a gap between the entrance door and the block; grouted joints and cracks. Cement additions fissure and come off the stone, cracks in the cement are filled with cement mortar again. There are as well cement mortars with different content of impurities

Block No. 11

Alabaster molding block, consists of five ribs

State: unsatisfactory

Losses: not detected

Deterioration: stone stratification, mechanical damages, numerous splits, deep flat furrows are cut horizontally on the jamb of the block in a chaotic order, there are also numerous furrows on the surface of the stone, which can be a consequence of the mechanical cleaning with metal brushes. Erosion of the surface of the stone, numerous cavities, cracks, furrows

Cracks: six large deep cracks, which can lead to chipping off considerable part of the block. Numerous minor and small cracks.

Contamination: yellow spots, black patina, a part of the cement additions between the block the entrance door is in black, red and green colour

Panels: five alabaster panels of different colour – white, grey

Additions: three small cement additions on the ribs of the block, as well as between the entrance door and the

	block; grouted joints and cracks. Cement additions fissure and come off the stone, cracks in the cement are filled with cement mortar again. There are as well cement mortars with different content of impurities
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Block No. 12

Alabaster molding block, consists of five ribs

State: unsatisfactory

Losses: considerable part of the fourth rib of the block is lost. A part of the ruined block (the fourth one) was supplemented with the alabaster panel, which is lost as well. There are preserved marks of panel mounting: four hewn rectangular chamfers and cement mortar on which the panel was fixed. A little fragment of the third block is lost too.

Deterioration: stone stratification, mechanical damages, numerous splits, deep flat furrows are cut horizontally on the jamb of the block in a chaotic order, there are also numerous furrows on the surface of the stone, which can be a consequence of the mechanical cleaning with metal brushes. Erosion of the surface of the stone, numerous cavities, cracks, furrows

Cracks: four deep cracks, the biggest one is on the jamb of the block and follows all over its height

Contamination: yellow spots, splashes of green and red paint, a part of the cement additions between the block and the entrance door is in red, green and black colour.

Panels: four alabaster panels of different colour – grey and white

Additions: a gap between the entrance door and the block, joints between the blocks, cracks and splits are filled with cement mortar

Block No. 13

Result of the restoration work: four square planes with a transition to the molding body of the portal. Profile of the ribs looks like an astragal. There are six ribs. The bead moldings have a prismatic and curved form. The square planes of the block have a bush-hammered decoration with fluted arrises.

State: satisfactory

Losses: not detected

Deterioration: small splits and cavities

Cracks: one crack between the cement addition and the stone

Contamination: black patina, splashes of black and red paint, cement mortar on the rib of the profile. Small spots of orange and red colour, which resemble the spots of rust. The yellow and white spots caused the dampness of the stone. Cement additions are in green colour.

Additions: a gap between the block and the entrance door all over the height of the block filled with cement mortar; grouted joints, cracks, cavities. Cement additions fissure and come off the stone

Block No. 14

Result of the restoration work: Four stone rectangular planes, which follow the angle of the portal, are made of sandstone. The surface finish of the stone looks like a bush-hammered plane with fluted arrises.

State: satisfactory

Losses: decorated surface finish of plinth is partly lost

Deterioration: one of the plates comes off the plinth; small splits; weathering of the stone, yellow and white spots.

Cracks: not detected

Contamination: black patina

Additions: a gap between the block and the entrance door all over the height of the block filled with cement mortar; grouted joints, cracks, cavities.

Structure microanalysis of the alabaster stone samples and mortars of the portal of the parish Church of the Assumption of the Virgin Mary, Holy Cross and Bartholomew the Apostle in Drohobych.

In the study process of the gothic alabaster portal three samples of material were selected: authentic alabaster, alabaster panels, the cement and lime mortars. The alabaster samples, when possible, were chosen from every block and its elements (panels, the cement and lime mortars).

The samples were obtained in a mechanical way with a scalpel. The observation of the place, from where the sample was taken, and the marking on the sealed packages prepared for the samples, were carried out.

The samples were selected in order to establish the deposit of the stone taken for the portal, as well as to compare the structure of the alabaster panels and authentic alabaster, types of mortar used in different periods of the portal existence. The microanalysis of the samples established the finely crystalline alabaster structure with the presence of gypsum crystals, clay impurities and fibrous selenite veins (Fig. 5). The process of the crack formation – dissolution of the alabaster crystals – can be clearly seen in one of the samples (Fig. 6). The alabaster panels made during the restoration work are of different types of alabaster. There are panels of white alabaster block, variegated and grey alabaster stone.

The cement mortars differ from each other by the ratio of binding agent and component composition: brick, sand, gypsum, lime (Fig. 7–8).

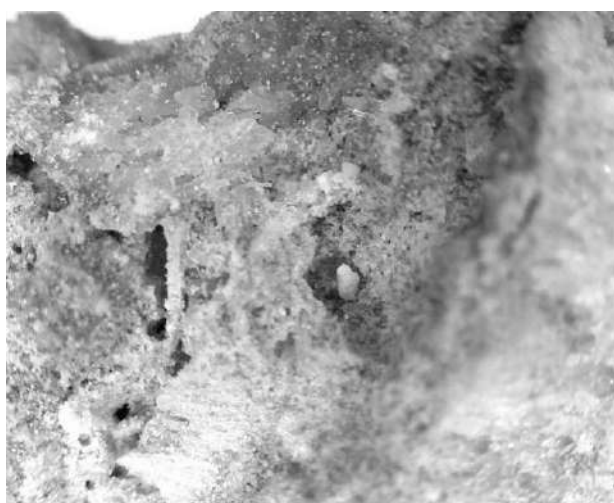


Fig. 5. Block 11. Sample XV. Clearly outlined structure of the alabaster crystals. Finely crystalline structure. Small content of clay impurities and veins of fibrous selenite

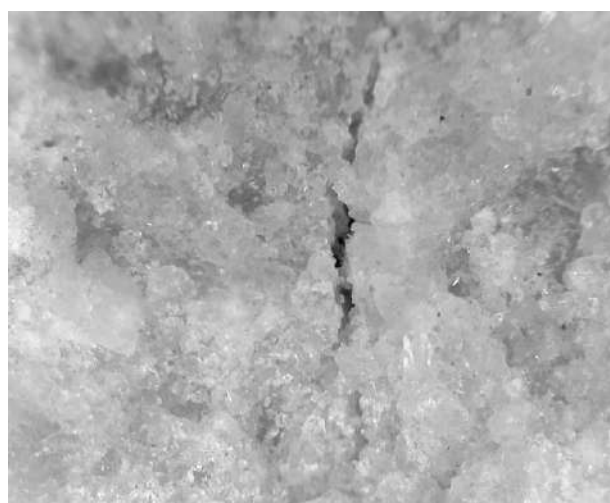


Fig. 6. Block 7. Sample XI. The process of water erosion and void formation was observed, which caused the cracks in the stone

The alabaster quarries used in XIV–XV centuries and which correspond to the textural characteristics of the alabaster portal were selected in order to establish the origin of the alabaster used for the building of the portal. The closest to the aforementioned criteria is the alabaster from the quarry in Shchyrets. This dark-grey alabaster has a rich colour range, veins and white, grey, brown spots caused by the content of different impurities – stratification of gypsum and clay layers, as well as veins of fibrous selenite and satin spar, iron oxide etc.

Thin sections of alabaster were taken for comparison from the Shchyrets quarry.

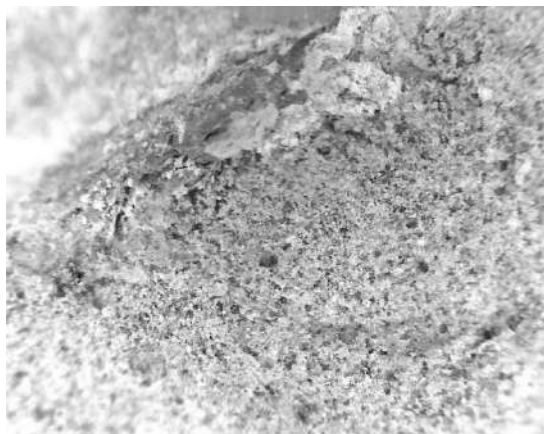


Fig. 7. Block 6. Sample IX. Lime and sand content is bigger than cement content. Mortar structure is porish



Fig. 8. Block 1–2. Sample XIX. Impurities of brick powder and lime

Conclusion

The state of the gothic alabaster portal of the church of St. Bartholomew in Drohobych is unsatisfactory: a great number of splits, cavities, minor, deep and large cracks, contamination and dampness, weathering, cement additions, losses.

The reasons of deterioration are, first of all, weather conditions: rain, sudden temperature change, sun, wind. Microanalysis showed that the structure of the authentic alabaster is finely granular with the gypsum crystals, intercalation of clay layers, fibrous selenite, and iron oxide. The alabaster stone is not covered with any hydrophobic mortars, which could prevent water penetration. Rain, sun and wind cause weathering and stratification of stone. Water, which gets between the alabaster crystals washes them out, and consequently cracks and furrows emerge. The sudden temperature change, freezing and melting of water in the cracks lead to the increase in their number and size.

The second reason is that the panels are made of different types of alabaster, which differ in colour and crystal structure. The alabaster stones with heterogeneous impurities are noticeably more likely to be deteriorated.

The third reason lies in cement mortars. They were used for additions and cracks jointing, fixation of the alabaster panels. Cement contains water, which melts the alabaster. Also, cement strongly fastens to the uneven stone surface and when the cement chips off the same happens to the alabaster crystals. The microanalysis carried out on the cement mortars from different pieces of the portal showed the dissimilarity in its component composition: sand, brick, lime, which affects the level of water absorption and drying rate. These differences cause the cracks formation.

The fourth reason is mechanical loading, which results into the formation of deep and large cracks. The biggest loading falls on the upper keystone part of the portal, which is now in the critical condition.

These factors can be the reason to the portal collapse. There is an urgent need for its restoration.

According to the results of the characteristic study of the alabaster, based on the visual observation and microanalysis, was established that the alabaster for the portal of the parish church in

Drohobych was obtained from the quarry in Shchyrets. The historical information about the Shchyrets mineral deposit in Pustomyty region, the texture and the structure of the alabaster fully correspond to the portal stone features.

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ПРИЧИНИ РУЙНУВАННЯ АРХІТЕКТУРНИХ ДЕТАЛЕЙ З АЛЕБАСТРОВОГО КАМЕНЮ. (НА ПРИКЛАДІ, ГОТИЧНОЇ ЦЕРКВИ У ДРОГОБИЧІ)

Анотація: У статті подано детальний опис стану збереженості унікального готичного алебастрового portalу парафіяльного костелу в Дрогобичі. Визначено положення portalу в плані костелу. Встановлено основні причини та наслідки руйнування алебастрового каменю. Опрацьовано та доповнено історичну довідку про фундацію portalу і зміни які відбулись під час відновлювальних робіт в ХХ столітті. Згідно з результатами проведених досліджень (мікроаналіз, візуальні спостереження, порівняння) встановлено родовище з якого постачали камінь для зведення portalу. Мікроаналіз відібраних зразків показав структуру і різновид алебастру, природній процес розчинення кристалів алебастру, складові частини цементних розчинів.

Ключові слова: алебастр, портал, парафіяльний костел, Дрогобич, руйнування, причини, наслідки

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**CONSERVATION OF MEMORIAL MONUMENTS
AT HISTORICAL CEMETERIES – CHALLENGES
AND PERSPECTIVES**

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Abstract. The article analyzes the main restoration problems facing the restorer when working with memorial monuments at the historical cemetery. The method of solving these problems is offered on the example of diploma works of students of the specialty “Stone art works conservation” of the Architecture and Conservation Department of “Lviv Polytechnic”. NU.

Key words: conservation, memorial monuments, natural stone, historical cemetery.

Formulation of the problem

Historical cemeteries are an integral part of the cultural landscape of each city or town, evidence of the ideology and spiritual life of their time. In many settlements of Ukraine cemeteries have been preserved, which we now call historical, and which today are potential memorials and are of interest to researchers and admirers of history, architecture, and art. Three Ukrainian cemeteries have the status of reserves: The State Historical and Memorial Lukyaniv Reserve in Kiev, the State Historical and Cultural Museum “Lychakivskyi Cemetery” in Lviv and the Cultural Reserve on the Green Street in Chernivtsi. This status should protect them from destruction and give the possibility of conducting research work. Thus, cemeteries in large cities already are the museums or can become them. The cemeteries of small settlements – towns, villages, are smaller, but, as a rule, they are examples, actually the collections of folk memorial sculpture.

Regardless of the size and status of the cemetery, there is no object in Ukraine in an absolutely perfect condition. Each cemetery requires uninterrupted care and ordering. Unfortunately, there are many historical cemeteries that are in an exceptionally neglected and poor condition. Such cemeteries require the ordering and conservation as a whole object, as well as the restoration of individual samples of the memorial monuments.

Still, the main material on the cemetery is a stone, although metal, wood and other materials also exist, but the stone clearly dominates. So, we work with stone. Below we are talking about restoration problems and methods of work with memorial monuments at the historical cemeteries on the example of diploma works of the students of the Architecture and Restoration Department of Lviv Polytechnic NU.

Analysis of recent research and publications

The author relies on state regulatory documents of Ukraine. In particular, if necessary to perform the additions the composition of the restoration mass is in accordance with the State Building Regulations in the section “Restoration, conservation and repair works on cultural heritage monuments” – an official document approved by the order of the State Building Committee of Ukraine (SBC B.3.2-1-2004.).

One of the most comprehensive and most powerful works relating to the restoration of stone monuments was published in 2011 in Torun at the University of M. Copernicus (Domasłowski, 2011). The book is written by a team of authors and edited by Professor W. Domasłowski. The book is based on the great practical experience and a modern research base and is a true vocabulary for every young restorer. The book contains tips for dealing with biopsy, salt, patina, and the like.

In Lviv Polytechnic National University the catalogs of diploma work of students of the specialty “stone art works conservation” are published (Bevz, M., Stasyuk, O., 2016), (Bevz, M., Stasyuk, O., 2017) These publications provide a brief description of each work and present work photos before and after conservation, and the most interesting fragments of the restoration documentation and work process. The photographs can clearly trace the volume of these works and their philosophy.

The purpose of the article

The purpose is to show the main problems that happen during the conservation of the memorial monuments on the historical cemeteries on the specific examples, to highlight the methods and techniques used to eliminate these problems and to offer options for preventive action to maximize the preservation of restored memorials.

Presentation of the main material

Speaking of the memorial monuments conservation at the historical cemetery come out that the history has developed in such a way that many of these cemeteries were partially or completely ruined and destroyed. The memorial monuments of such cemeteries often becomes part of museum collections, lapidary, sometimes private collections, and so on. Such facilities usually require restoration. So in 2016 a section of the cross with a crucifixion from the tombstone was transferred to the Department of Architecture and Conservation by the Museum of Sacral Art named after Anton Petrushevich, Lviv diocese of the UGCC for restoration works. A memorial was found at the cemetery in the village Nemyriv Yavoriv district, Lviv region. This work was performed and defended in the same year by the student Hanchevska Olena. Material and technique of execution indicated that the cross belongs to the Brusno masonry school. (Lew, S., 1967, c 193). The monument was created at the last 19-th – early 20-th century. Material – limestone, technique of execution – carving in a stone. The crucifix was broken down below the knees of Jesus. Stars are placed around the head of the Cross (solar signs); It is assumed that this cross was with two settlers that are lost. When entering the conservation, the condition of the object was unsatisfactory (Fig. 1). The lower part of the cross with the legs of Jesus is lost, and both arms from the elbow to the wrists are lost, and the upper part of the cross is opaque. The object was in a contaminated state with a layer of dust, dirt and cement mortar and biodeterioration. During the restoration, the cross was cleaned of dirt, cement mortar, patina, biodeterioration, and salinity of the monument was eliminated. The addition of the lost part of the cross was made of artificial stone. The reinforcement was use. Lost pieces were modeled and supplemented in artificial stone. The invoice has been executed, and the monument has been strengthened (Fig. 2). The monument is kept in the museum of Sacral Art named after Anton Petrushevich.

The gravestone monument in the form of a cross decorated with the Crucifix was particularly widespread in the cemeteries near Lviv in XIX – early XX- th century. (Kuzenko, P., 2008, c. 69–73).

This is a time of a special rise in the stone processing industry. Stone memorial monuments in the form of cross with a crucifix is artistically enriched, developed and complicated and becomes a significant element of folk art (Mozdir, M., 2009).

The Museum of Sacred Art possesses a large collection of stone sacral monuments, and in 2016 and 2017 it transfers to the Architecture and Restoration Department a number of monuments that originate from the village of Nemirov, Yavoriv district. It is a white stone cross with a crucifix with the lost lower part of the cross and the face of Jesus. When entering the conservation, the cross was in a contaminated state with a layer of dust, earth, limestone, patina and a large number of different kinds of biodeterioration. The restoration of this object was performed by student Yankiv Nastya. In the process of restoration, the cross with a crucifix was cleaned of surface contaminants, patinas and biodeterioration. Supplemented lower part of the cross that was lost. Created texture like a natural stone. The stone is strengthened. One more tombstone monument in the form of crucifix with the forthcoming was restored by student Makaruk Marina in 2017. When entering the conservation, the cross was in a satisfactory condition. The main parts of the monument are preserved. There was an insignificant loss on the drapery of the tissue coming. The monument is covered with dust and dirt, biodeterioration. and patina. The monument was thoroughly cleared from the dirt, patina and biodeteriorations, an addition was made.

The next gravestone monument in the form of a cross with the coming, which entered the conservation in 2018, was damaged already much more seriously (Fig. 3). At the time of receipt for conservation the cross was broken into two parts, there was no left arm, the body of Jesus, the drapery, the wreath on the head of Jesus, the heads of the coming were damaged. The monument was covered with dust and dirt, mosses. The monument was thoroughly cleared of pollution and mosses. All parts were glued and armed. The losses have been supplemented the left arm of the cross, the end of the right arm, the body of Jesus, the heads of the coming (Fig. 4).



Fig. 1. Object at the time of receipt for conservation



Fig. 2. Object after performing of conservation work



Fig. 3. Object at the time of receipt for conservation



Fig. 4. Object after performing of conservation work.

Most seriously damaged monument in the form of a cross with the Crucifixion and coming receipt for conservation in 2017. The cross comes from the non-existent Ukrainian village of Sukha Volya, which is currently located in the Podkarpackie Voivodship of the Republic of Poland. At the time of receipt for conservation, the condition of the object was critical. Crucifixion was broken into nine separate parts (Fig. 5). The crucifix itself was broken into two part, the right figure from the cross was broken into two, the left – for three parts. Two more parts were repulsed from the corners of the cross, from the upper and lower. Probably the stone cross broke down when falling. For a long time, the monument was underground so the time of receipt for the conservation it was very dirty. Pores contain a large number of different types of biodeteriorations. The conservation was carried out by student Vlasyuk Julia. According to the technique of execution and the origin of the monument was attributed to the Brusno stonemasonry school. During the conservation, the cross was cleared of surface contaminants and biodeteriorations that were found in limestone pores. After complete cleaning, connection and gluing of parts of the stone cross, as well as addition of lost elements were carried out. The object was strengthened and colore unification was carried out (Fig. 6).

In addition to crosses with crucifixes and forthcoming as memorial monuments in our historical cemeteries, there are also so-called “figures”. This is a different size of round sculptures, most often the Virgin Mary with or without child, Jesus Christ, or some of the Saints. Such a sculpture is a vivid example of folk art. So in 2016 the Museum of Sacred Art transferred for the conservation a white stone sculpture of the Virgin Mary with the Child. The Virgin and the Child are depicted in the crowns. The Virgin is depicted with the child, Jesus Christ sitting on Her hand and pressed his cheek to her cheeks. During the work it was found out that the sculpture comes from p. Chemeryntsi village, Peremyshlyany district, Lviv region. Old pictures were found on which the sculpture is already lying on the ground. That

is, the sculpture itself collapsed, or was scattered to the ground. Mechanical damage and loss is obviously the result of a fall.

At the time the monument was received for the conservation it was in poor condition – The figure was covered with dust and biodeteriorations, there were insignificant layers of cement mortar on the lower part of the figure. The sculpture was completely covered with several layers of oil paints. Several fingers on the arms and legs were lost (Fig. 7). During the conservation work the sculpture was completely cleared of paint. The biodeteriorations and cement layers were eliminated. Recover lost parts. Stone was strengthened. A colored unification was carried out (Fig. 8).

Within the framework of diploma master's works the theme of conservation of the memorial monuments of the historical cemetery was considered more widely than restoration of a separate tombstone monument. In 2016, the area of distribution of the Brusno masonry school monuments was investigated by the student Gritsiv Olga. And a map of the distribution of these monuments on both sides of the modern Ukrainian-Polish border has been completed (Fig. 9). The methodology of inventory was analyzed, and the algorithm of research and restoration of the memorial legacy of the Brusno masonry school is drawn up. The information about the cemetery in the village Smolin of Yavoriv district was worked out, its partial inventory and conservation of one tombstone was carried out. The peculiarity of this work is that the restoration itself was carried out directly at the cemetery. The object of restoration was covered with dirt, dust, marsh and very clearly visible mosses. The monument, selected for restoration, stood firmly on the ground, did not flutter, did not fall and did not have any mechanical damage. Was thoroughly cleansed and strengthened. And it stayed in its proper place.

A similar work in 2015 was conducted at the New Jewish Cemetery in Brody town by students Yulia Kostetska and Zenik Shulba. In 1835 – the Austrian authorities allocated for Jewish community in the Brody the land under a new cemetery. The cemetery was also marked on cadastres and military maps. He was given the name “New Jewish Cemetery”. A detailed and complete inventory of a whole cemetery was conducted. The character and peculiarities of the memorial carving, as well as polychrome and color symbolism of the matsevs were investigated. Regarding polychromy: so it was possible to investigate it. It is clear that, initially, all mattsevs on the cemetery were colored. However, today polychromy is preserved on matsev, only in those places that were least exposed to adverse natural factors, as it were in the lower part, or part which was hidden by other mattsevs or were in the soil. That is, today we can reconstruct the color of the mattsevs. In the main graves at the cemetery belong to the 19th century and the most recent ones to the 30s of the 20th century. Two mattsev were found made in the barco style. By artistic analysis one can assume that they belong to the late 18th century. The latest graves are dated 1939. As for the inventory then really huge work was carried out (Fig. 10). I want to submit calculations. At the cemetery in Brody, the largest matsevs are more than three meters high, and the smallest are only 30 cm high. The cemetery contains approximately 8120 matsevs, but only 5477 whole matsevs have been preserved, lying and destroyed matsevs in the amount of 539 pieces, of which the undamaged lying is 356; lying split into two parts is 40; lying split into many parts is 37; lying matsevs broken near the base is 83; The split fragments of matsevs are 13, and the stone bases in the amount of 2118 and yet an unknown number of tombstones was lost. For today, the cemetery is not functioning, but we can say that it is preserved. Some of the tombstones fell, but this is obviously a natural process. There are no traces of intentional target destruction or vandalism. In addition to the research work, each student conserved to two mattsevs. At the time of receipt for conservation, the selected mattsev were in an unsatisfactory condition. The monuments were contaminated with earth, patina, mosses, lichens, the stone was partially crushed. Significant mechanical damage and loss were present. Mattsevs were cleaned, dissolved, eliminated biological contamination, made gluing and addition of lost parts, the insertion of cracks and fugging stitches, color unification and strengthening. was conducted. All problems that caused the destruction of the stone were removed. Authenticity of the object is preserved.

In 2018, a study of a cemetery on Chernecha mountain in the village of Univ, near the town of Peremyshlyany was conducted by the student Taras Hrin. In Univ, the architectural complex of one of the largest Christian shrines of Galicia – Assumption Univ Lavra has preserved. There is no exact information about the date of the monastery's foundation, but in the documents of the beginning of the 14th century, Univ is mentioned as one of the spiritual centers of Galicia. It was in the second half of the 13th century in the northwest of Chernecha Hill a new Univ male monastery rise up. After the ruin and tragedy Chernecha Mountain almost two centuries fell into desolation. The monastic cemetery took a part of the territory of the former monastery. There were buried, as I. Mitsko points out, a lot of people which came from a certain kind of Galician prince Lev Danylovych. (Myts'ko, I., 1998). Today on Chernecha mountain in Univ there is a monastic cemetery. This cemetery consists of two parts, or maybe two cemeteries are one next to another. One part is a new one, operating with fresh burials and monuments in the form of even ridges of white-stone crosses. With inscriptions. Without any sculptural or other decor. Dates, names, buried spiritual persons. This cemetery is fenced with a metal forged fence. The second part is not fenced, it has fuzzy boundaries and borders. It consists of tombstones and small irregularly scattered low white stone crosses, which are half loaded into the ground. The condition of this part of the cemetery is very poor. During the study, an inventory of all objects of the old part of the cemetery was carried out. Previously, approximately the objects date back to the 17th century. Inventory means that the objects have been photographed, measured and described in detail. But this is every single object. The object is very interesting. This work is not finished yet and requires continuation.



Fig. 5. Object at the time of receipt for conservation

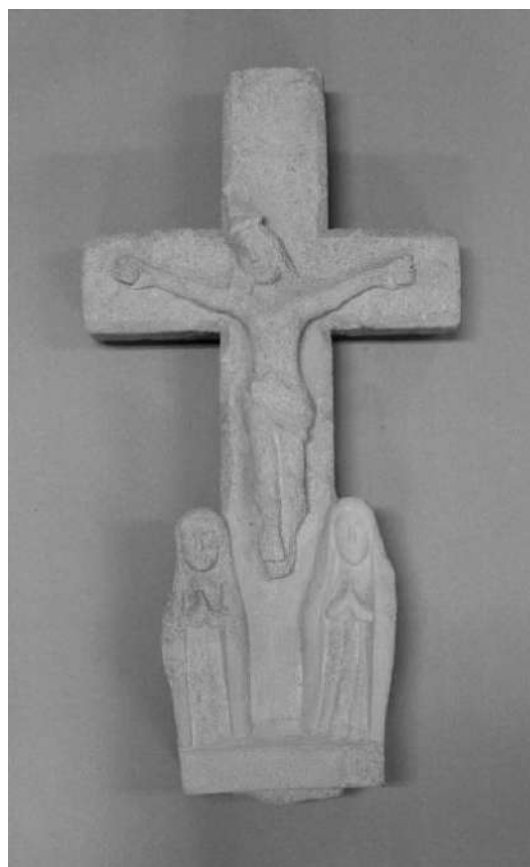


Fig. 6. Object after performing of conservation work



Fig. 7. Object at the time of receipt for conservation



Fig. 8. Object after performing of conservation work

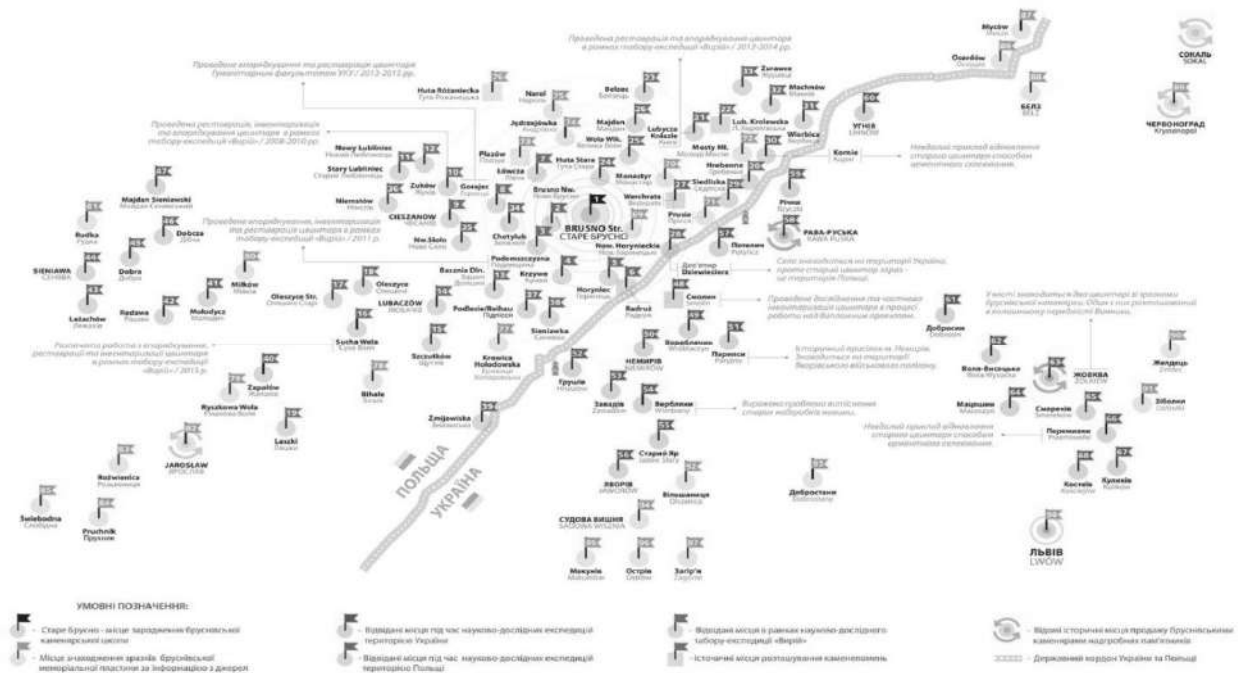


Fig. 9. A map of the distribution of the Brusno masonry school monuments

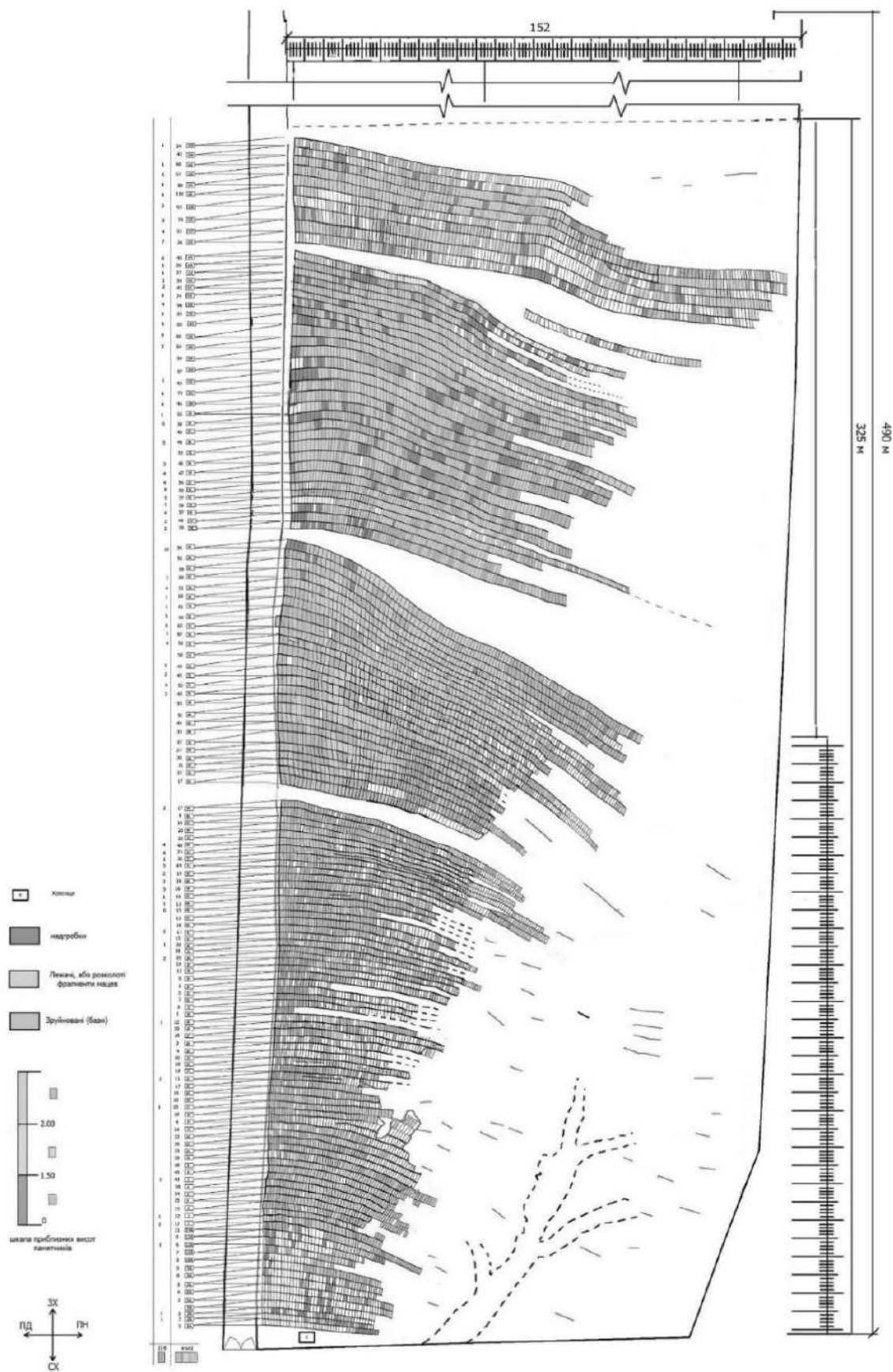


Fig. 10. Inventory the New Jewish Cemetery in Brody town

Conclusions

In Ukraine there are more cemeteries than settlements. Many of them already today are historical cemeteries, potential monuments, and therefore require care, protection, and conservation. As mentioned, absolutely dominant material on the cemetery is a stone. Therefore, speaking about the memorial monuments conservation of the historical cemetery, we are speaking about the conservation of stone. We distinguish a number of problems that are always encountered during the conservation of the memorial monuments of the historical cemeteries. And it does not depend on the size, status or belonging of the cemetery. The first problem that you always encounter and which one needs to solve is a biodeterioration – a variety of mosses, lichens, and the like. Biology strikes every stone. This problem is hidden in the nature of the stone. And it is very dependent on the climatic conditions and circumstances in which this stone is located. Here it should be emphasized that, as it were, in a picturesque and romantic way, moss does not look on the memorial sculpture or on the cross – it must be eliminated, destroyed. The presence of any vegetation on the stone leads to the irreversible destruction of the stone. Eliminating biology from stone can only be a chemical way. And it is made by a professional restorer.

The next problem is mechanical damage. If we exclude vandalism, we must understand that the land is a rather unstable basis – it is changing, moving. It's worth remembering that many of our cemeteries are densely planted with trees. From trees fall not only leaves, but also branches, and sometimes the whole trees fall. All these factors cause mechanical damage to the monuments. Certainly any mechanical damage can be eliminated and directed, but it is a damage which provokes other damages.

The next unpleasant circumstance is the adverse climatic conditions. We can not cancel or change it, but we can take it into account and minimize it. For example, the simplest cleaning of fallen leaves in autumn is of great importance. fallen leaves that lies on the stone wet and rot causes rapid reproduction of different varieties of biology. The same fungi or later mosses. Even on a freshly cleaned or conserved stones. A similar problem is with snow. The trouble is the multiple process of freezing and melting of water. Therefore, it is better to roll off the snow that falls out immediately. That is, the problem of climate is in parallel with the problem of the lack of proper care of the objects.

The next problem is unprofessional work with a stone, as painting with incorrect paint, additions or gluing with unusual materials. Fortunately, such problems are not encountered very often, but they are very difficult to eliminate. Here, may be the educational activities can be helpful.

With regard to maximizing the preservation of existing historical cemeteries of Ukraine, it is worth considering the possibility of giving these objects a status of a monument. I hope that this status will allow to spend more time, money, efforts for taking care and ordering memorial cemeteries. And it remains to say about educational activities. If people are aware of the importance, necessity, value of such a monument as part of their history and memory then the problem of preservation will be solved.

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РЕСТАВРАЦІЯ МЕМОРІАЛЬНОЇ ПЛАСТИКИ НА ІСТОРИЧНОМУ ЦВИНТАРІ – ВИКЛИКИ ТА ПЕРСПЕКТИВИ

***Анотація.** Історичні цвинтарі є невід’ємною складовою частиною культурного пейзажу кожного міста чи містечка, свідченнями ідеології і духовного життя свого часу. У багатьох населених пунктах України збереглися цвинтарі, які ми тепер називаємо історичними, і які вже сьогодні є потенційними пам’ятками та становлять інтерес для дослідників та шанувальників історії, архітектури, мистецтва. Три українських цвинтарі мають статус заповідників: Державний історико-меморіальний Лук’янівський заповідник, Державний історико-культурний музей-заповідник “Личаківський цвинтар” та історично-культурний заповідник “Кладовище на Зеленій вулиці” у Чернівцях. Цей статус має захищати їх від знищення та дає можливість проводити науково-дослідну роботу. Отже, цвинтарі у великих містах є пам’ятками-музеями або можуть ними стати. Цвинтарі невеликих населених пунктів – містечок, селищ, сіл – є меншими, зате, як правило, вони є зразками, а властиво колекціями народної меморіальної пластики.*

Незалежно від розміру і статусу цвинтаря в абсолютно ідеальному стані об’єкта в Україні нема. Кожен цвинтар вимагає безупинного догляду і впорядкування. На жаль, існує багато історичних цвинтарів, які перебувають у дуже занедбаному і жалюгідному стані. Такі цвинтарі вимагають впорядкування і реставрації, як об’єкт загалом, а також реставрації окремих зразків меморіальної пластики.

Основним матеріалом на цвинтарі є все-таки камінь, трапляється також метал, дерево та інші матеріали, але камінь однозначно домінує. Нижче йдеться про реставраційну проблематику та методичку роботи на історичному цвинтарі з меморіальними пам’ятками на прикладі дипломних робіт студентів кафедри архітектури та реставрації Нац. ун-ту “Львівська політехніка» .

Коли йдеться про реставрацію меморіальної пластики історичного цвинтаря, то історія склалася таким чином, що багато цих цвинтарів було частково або повністю зруйновано, знищено. Меморіальна пластика таких цвинтарів часто стає частиною музейних колекцій, лапідаріїв, деколи приватних збірок, тощо. Такі об’єкти зазвичай потребують реставрації.

У статті на конкретних прикладах показано основні проблеми, які трапляються при реставрації меморіальної пластики на історичному цвинтарі. Висвітлено методи та способи, які були використані для усунення цих проблем. Зокрема музей сакрального мистецтва ім. Антона Петрушевича Львівської єпархії УГКЦ, володіє великою колекцією кам’яної сакральної пластики і у 2016 і 2017 роках передає на кафедру архітектури та реставрації ряд пам’яток для проведення реставраційних робіт. Це переважно були хрести з розп’яттям з і без предстоячих та фігури. Кожна з пам’яток була пошкоджена в інший спосіб і вимагала іншого підходу до реставраційних робіт.

В рамках дипломних магістерських робіт тема реставрації меморіальної пластики історичного цвинтаря розглядалася ширше ніж реставрація окремо взятого надмогильного пам'ятника. Декілька разів об'єктом реставрації виступав цілий цвинтар. А в рамках наукової роботи було досліджено ареал поширення пам'яток Бруснівської каменярьської школи та накреслено алгоритм дослідження, і реставрації меморіальної спадщини цієї школи. Подібну роботу в рамках магістерської дипломної роботи було проведено на Новому єврейському кладовищі у місті Броди. Проведено докладну і повну інвентаризацію всього цвинтаря. Було досліджено характер і особливості меморіальної різьби, а також поліхромію та кольорову символіку мацев. Крім дослідницької роботи, кожен зі студентів відреставрував по дві мацеви. І останньою з подібних робіт є дослідження цвинтаря на Чернечій горі в селі Уневі, що поблизу міста Перемишляни. Під час дослідження було проведено інвентаризацію всіх об'єктів старої частини цвинтаря. Було відреставровано 2 надгробні плити. Ця робота ще не закінчена і вимагає продовження.

Виокремимо низку проблем, з якими завжди стикаємося при реставрації меморіальної пластики незалежно від розміру, статусу, приналежності цвинтаря. Перша проблема – це біоураження. Ще однією проблемою є механічні пошкодження. Серед неприємних обставин є і несприятливі кліматичні умови. Ми не можемо їх скасувати чи змінити, але ми можемо їх врахувати і мінімізувати. Проблемою тут можемо назвати брак належного догляду за об'єктами. Наступною проблемою є непрофесійна робота з каменем, як то малювання не властивою фарбою, доповнення чи склеювання невластивими матеріалами. І залишається ще сказати про просвітницьку діяльність. Якщо люди усвідомлюватимуть важливість, потрібність, цінність такого пам'яткового об'єкту як історичний цвинтар, як частину своєї історії і пам'яті, то проблема збереження буде вирішена.

Ключові слова: *консервація, меморіальні пам'ятки, природний камінь, історичне кладовище, житлові будинки, панельні будинки, "хрущовки", реконструкція житла, стан інженерних мереж, гаражі, життя будинків.*

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[1] Kovalskiy D. and Plekhov V.: Neorganichna Khimiya. Naukova dumka, Kyiv 1990.

[2] Hess M.: High Performance Polymers [in:] W. Brostow (Ed.), Performance of Plastics. Hanser, Munich-Cincinnati 2000, 277–289.

Journalpaper: Authors (4), journal (all the words with a capital letter), year, volume, initial page

[3] Yamamoto T., Furuhashi T., Arai N. et al.: Energy, 2001, 26, 239.

[4] Novakivskiy V., Gerber D. and Malynovskiy D.: Dopovidi Nats. Akad. Nauk Ukrainy, 2007, 66, 198.

Patents: Authors, country and patent number, date of publication

[5] Vaynberg M., Horn H. And Horn R.: Pat. US 6981377, Publ. Oct. 13, 2006.

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[6] Young C. And Jordan T.: Proceed. 10th Annual Conference on Engineering, Greece, Patras 2008, 34.

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