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## **GEOLOGICAL NARRATIVE OF HISTORICAL GALICIAN CEMETERIES IN TERMS OF RESTORATION**

***Abstract.** The historic cemetery is an integral part of the architectural landscape of each city, the confirmation of ideology, the spiritual and economic life of its time. Cemeteries dating back to the second half of the 18th century have been preserved in many cities of Galicia. Now we call them historical cemeteries. Most of them are no longer in use and are filled not only with historical but also artistic monuments made mainly of stone. Such cemeteries require constant care and uninterrupted supervision. Preserving the physical substance of these cemeteries is a great challenge and a difficult task. To do this, it is necessary to conduct mineralogical and petrographic studies of the stone material of the historic cemeteries of Galicia. The state of preservation of natural stone, which is most common in the historical cemeteries of Galicia, was analyzed, the types of this stone damage were investigated. Also, preventive measures to preserve the stone material of the historic cemeteries of Galicia are proposed.*

***Keywords:** architecture, restoration, cemetery, heritage, work of art, natural stone, geology*

Our ancestors, having accepted Christianity for the burial of the dead, adapted to the traditions of the new religion. It was also a way of honoring the deceased which was customary to bury (od sanctos) in the holy land - in the church or near it. In 1059, the Roman Council adopted rules ordering the allocation of land for cemeteries near the temples. The size of the ground for the cemetery near the temple was to be 60 steps (approximately 45 m), and near the chapel 30 steps (approximately 22.5 m). The church authorities considered this land to be part of the

temple [1]. According to this doctrine, the existence of a cemetery was treated as a natural right.

The city authorities of Galicia did not create or maintain communal cemeteries except for determining the place for the so-called "Cholera" or "leprous" cemeteries. The city council did not create cemeteries behind the city walls, although the problem of overcrowded cemeteries, and especially the large number of burials in the sacred buildings of the city has been felt since the fifteenth century [2].

The main reason for closing the churchyard cemeteries in the late 18th century. was a belief about a possible threat to the health and life of the population, according to the then level of science and education. Especially medical circles began to loudly seek change, fearing further possible outbreaks of epidemics. The voice of doctors in the discussion on these topics was carefully listened to and taken into account. In Western Europe, where the opinion of doctors was accepted by the ruling elite of the states, this led to appropriate internal reforms to change the situation. The change in the legal system took place in order to protect the population from mass epidemiological threats. First of all, cemeteries near shrines were liquidated.

From a sanitary point of view, the situation in Vienna at the beginning of Maria Theresa's reign was bad. Even in Vienna, the capital of the Habsburg Empire in 1740, there was no night lighting, the paving of the streets in the city center was destroyed, and there was none on the outskirts. There were many cemeteries in the city, which were very crowded. As early as 1750, lighting appeared on the main streets of Vienna, and the main streets and roads to the polling stations were repaired. At the same time, sanitary procedures began to be introduced throughout Austria. In the late 18th century in overcrowded churchyard cemeteries the Austrian administration identified an epidemiological threat. In the capital of the monarchy, in accordance with the will of Joseph II, supported by the publication of legal acts, church cemeteries were closed and new ones were created outside the city's defensive walls [ 3 ].

These legal acts extended to the whole empire until the early nineteenth century in all major cities and towns, new cemeteries were created on the then outskirts of cities. Today we call these cemeteries historical. Not only the spiritual or ideological

history of the city but also its economic power can be read very well in the historical cemetery. As history shows, the heyday of art coincides with the economic heyday of the place. As for the use of material in construction, in architecture in general and in the cemetery in particular, historically used the material that was available in the area. As for building stone in Galicia - there have long been developed deposits of gypsum (alabaster), limestone and sandstone, which are very powerful in this area. Travertine was used much less frequently in construction, which is associated with both lower deposit capacity and the physical and mechanical characteristics of the rock. In the fifteenth century, there were already quarries around which the locals worked with the stone, using it for construction and initially making household products. Stonemasonry schools were gradually formed.

In terms of material, large cemeteries in large cities have an extremely wide range of stone materials from local limestone or sandstone mined nearby to brought granite or imported marble. It is this wealth of stone material in the cemetery that testifies to the economic power of the settlement.

The cemetery, and especially the large cemetery of the big city, consists not only of tombstones. This is a whole complex which includes a fence and entrance gates, chapels, tombs, sometimes a church, staff buildings, a grid of paths, roads, alleys, stairs, squares, etc. and landscaping. For example, in Lychakiv Cemetery in Lviv, the boundary walls and entrance gates are made in the Neogothic style. Brick walls and stone gates. With metal grilles of door leaves. Alleys and paths are paved with natural or artificial stone. Chapels on Lychakiv are family tombs of wealthy families. 24 chapels have been preserved. They are all built of stone - natural or artificial [ 4 ]. As for the tombstones, there is no outstanding sculptor who lived or worked in Lviv and would not have left his work in Lychakiv. Lychakov's sculpture demonstrates all the artistic styles that have changed in Lviv sculpture since the classicism of the eighteenth century to our time.

The oldest part of Lychakiv is made of limestone and sandstone. The sculptor who experimented the most with the materials was Leopold Schimzer. He used Polyansk sandstone, Volyn granite, Carrara marble, alabaster from a quarry in Berezdivtsi (now Mykolaiv district, Lviv region), as well as Labradorite from

Zhytomyr region (Golovinsky quarry). All these materials were used to make monuments that were erected in Lychakiv Cemetery. For example, a portrait medallion made of Carrara marble is installed on the grave of Jan Dragowski. The tombstone of Hydrangea Yakubovych and the obelisk on the tomb of Vincent Tsemirsky are made of labradorite. A statue of the Virgin made of Carrara marble was installed on the grave of Teresa Kovnatska. Similar portrait medallions, figures of the Mother of God and angels from Shimzer's workshop were installed in cemeteries in Przemyśl, Javoreev, Stanislaveev and probably in other cities [5].

The historic cemetery of Przemyśl is an almost exact copy of Lychakiv Cemetery in Lviv. The same brick wall, very similar gates and very similar filling - tombs, paths, tombstones. Slightly smaller than Lychakov. The city is smaller and the cemetery is smaller. And another difference in the cemetery in Przemyśl is only one chapel - the funeral cemetery chapel. That is, every funeral in the cemetery begins from this place.

The historical cemetery of Kolomyia, for example, is a little younger than Lychakiv. And a little smaller. This cemetery does not have such a wall as in Lviv or Przemyśl. However, it has the same character of tombs and sculptures, alleys and paths. It is about the same size as in Przemyśl, commensurate with the city. There is no chapel in the cemetery in Kolomyia - there is a church. Wooden, working. Funerals here begin with the church.

As for the stone material, it is very similar. All the described cemeteries have a complete palette of the listed materials. Sandstone of different colors, structures and textures. Sometimes dominated by red or brown color, yellow or gray or greenish color. It can be fine or medium-grained, massive or layered. Limestone is also found in different colors, but the color palette already ranges from light gray to yellowish or honey. Limestones also differ in structural and textural features, the presence of faunal remains. Rocks such as gabbro, basalt, granite, marble or artificial stone are much less common.

It is worth noting that in small towns or villages we trace the presence of one stone material in the cemetery. Most often from a local source. And it does not depend on the quality or richness of the memorial sculpture in the cemetery. The

village cemetery can be just a museum of folk sculpture. A striking example is the historic cemetery in the village of Demnya. Stone processing was one of the traditions of the residents of Demnya village. There are deposits of limestone, which is well processed. The limestone quarry is still operating. And in 1772–1918. the inhabitants of the village extracted stone in their gardens and worked it with simple tools [ 6 ]. All the monuments in the cemetery in the village of Demnya are made of local limestone by local craftsmen. Cemeteries filled with products of Demyan masters can be seen in every cemetery - in Mykolayiv, Khodoriv, Zhydachiv, Bibrka, Gorodok and the surrounding villages.

Well-known quarries of Rostochany limestone are located near the village of Stare Brusno. Old Brusno is located on land that is historically called Galicia. Its history is very similar to the village of Demya. Its inhabitants also first mined stone in their gardens and made millstones from it. And from the eighteenth century. in addition to economic needs, the artisans of Old Brusno began to make the first stone crosses and this grew into the production of tombstones [ 7 ]. The village of Stare Brusno no longer exists, but the historic cemetery of the village has been preserved, it is a monument and a real open-air museum. All tombstones in this cemetery are apparently made of local stone by local craftsmen. Accordingly, cemeteries filled with products of Brusniv masters can be seen in every cemetery in Lyubachev, Yaroslavl, Yavoriv, Mostyska and the surrounding villages.

Galicia is also rich in sandstone deposits. The most famous is the Terebovlya sandstone, the quarries of which are mentioned in the Terebovlya city acts from 1430 [ 8 ]. Gray-green, gray-pink or red-brown Terebovlya fine-grained sandstone has been mined and used as a building material for about seven hundred years for the construction of houses, temples, fortifications, bridges, as well as for the manufacture of sculptures, including cemetery plastics. Although Terebovlya is not such a small town in the historic cemetery of Terebovlya, we see only the local sandstone. We see similar cemeteries made of local sandstone in the villages surrounding Terebovlya.

Despite the economic capacity of the settlement and the size of the cemetery, most of the memorial sculptures in historic cemeteries are made of limestone.

Regarding the condition of the stone on the cemetery plastic. In a favorable situation, this means absence of vandalism, of ideological destruction of burials and natural disasters, natural stone is a very durable material. The most durable material is considered to be quartzite, granite, syenite, gabbro – their sustainability is from 250 to 650 years, but their share is insignificant on historic cemeteries in Galicia. Sandstones and limestones belong to the category of relatively durable materials, the service life of which expires in 150 years. It should be noted that the nature of the stone is such that from the moment the stone leaves the quarry, it begins to age. Limestone changes color, is covered with patina, is easily subjected to biological destruction - that is, it easily grows moss, lichen, fungi, etc. (Fig. 1). Because of this, the color of the stone becomes variegated, uneven, and the surface layer is easily destroyed.



**Fig. 1. Biogrowths and the destruction of stone caused by them on the cross from the cemetery in Pidkamen**

Sandstone, like limestone, is compliant to biological destruction - that is, it easily grows moss, lichen, fungi, and so on. Small cavities are used by insects, which deepen them and use for housing. Under the influence of atmospheric and biological factors it changes color, covered with patina. Due to the structural features of the rock can be stratified on the planes of stratification (characteristic of Terebovlya sandstone). In areas of weak cementation, it may crack, especially when it is exacerbated by atmospheric or biological factors. Granite, labradorite are the most durable of the stones that are widely used in cemetery plastics. They do not change color, are not easily and quickly subjected to biological destruction. The polished texture of processing gives them special stability.

As for marble, this stone is also considered relatively durable but it is rarely used in cemetery plastics. In addition to being an imported and expensive material, our climate is completely unfavorable for this material. This refers to objects that are located outdoors. Instead, we can find many marble tombstones, sculptures, marble epitaphs in the interiors of churches and chapels, family chapels. In the cemetery we can see small details of a large composition, such as a bust of the buried, made of marble. Alabaster is the most short-lived material, so we do not find it in historic cemeteries, apparently due to its very rapid dissolution and chipping. But we also have many alabaster tombstones or sculptures in the interiors of sacred objects.

Beginning from the middle of the 19th century, monuments made of so-called artificial stone began to appear in cemeteries. In this case concrete, and more often reinforced concrete. Very often, military burials from the First World War were built of reinforced concrete. Most often it was just crosses. We can see such military fields on the territory of many historical cemeteries of Galicia. Many sculptors in the early twentieth century were willing to work with this new material. It is very malleable and allows you to perform complex structures that cannot be made of natural stone. Actually largely due to metal structures. And it is the metal structures, and in fact the oxidation and rusting of the metal that cause the destruction of many of these monuments (Fig. 2).

The big problem that affects the preservation of a work of art made of stone in the cemetery is the unprofessional care or repair of stone objects. The most common

problem is painting stone monuments. Most often in the late twentieth and early twenty-first century it was oil paint. The results of such actions are simply catastrophic. Under a layer of inappropriate paint, the stone is destroyed and crumbles. Over time, the paint begins to crack and crumble along with pieces of stone (Fig. 3). This applies not only to oil paint. Drawing a stone with any inappropriate paint and in the wrong way will lead to a similar result.



**Fig. 2. Destruction of a monument made of reinforced concrete**

Regarding the reasons for the unsatisfactory condition of the stone material in the historic cemeteries of Galicia. First of all, sometimes happens not the best quality of the stone material itself. This is its lack of strength, this is the presence of internal damage such as micro cracks. If the stone is layered, it is a property of the material itself which is amplified by the action of atmospheric factors, and you can't do anything about it later.



**Fig. 3. Destruction of a stone covered with oil paint**

Natural, climatic and biological factors play an important role in the destruction of stone material. They are often taken lightly, but in vain. We need to understand that they simply exist, they need to be known and taken into account. Not cleaning fallen leaves in combination with rain and snow become an excellent basis for the reproduction of various biologies such as mosses, lichens, fungi, etc. Uncleaned snow in combination with a sharp drop in temperature also poses a great danger. Melted snow is water that penetrates into the smallest cracks, pores, holes in the stone. And at repeated sharp freezing these microcracks increase and increase until finally break down a stone. It should also be added to the natural factors that in Galicia trees and other plants grow in cemeteries, as well as wild animals such as moles, etc. live there. The earth is moving and sometimes the stone monuments are losing their balance and falling. Not to mention the cases when trees fall. This, in turn, results in mechanical damage to the stone, leading to the complete destruction of the monument.

And the latter is the human factor. Starting from just vandalism, which is often found in historic cemeteries. And unfortunately, non-professional care or repair of stone objects also causes great damage.

#### Conclusions.

There are a large number of historical cemeteries in Galicia, which are already monuments or can become historical monuments and open-air museums. They deserve protection and care.

It is necessary to establish the legal status of historical cemeteries in Galicia and throughout Ukraine, which will undoubtedly help to more successfully carry out landscaping and restoration work, scientific research and studies at such facilities.

Owners of historic cemeteries need to take preventive measures to protect their objects, especially if these objects are works of art. Preventive measures to minimize the harmful effects of natural factors are regular cleaning and scrubbing. That is, in fact, regular take care for monuments and art peaces. The human factor must be neutralized through legal instruments.

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