

CONSERVATION OF ARCHITECTURAL AND ARTISTIC HERITAGE

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**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. Gątkiewicz (Gątkiewicz, 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 Ostojka, 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.

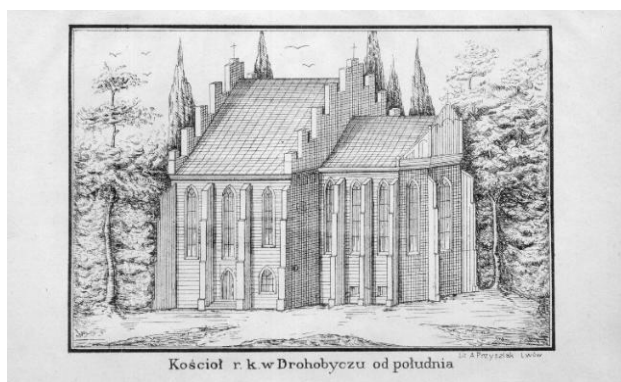
The works of V. Halyk (Galyk, 2017), M. Mściwujewski (Mściwujewski, 2018), T. Trajdos (Tadeusz, M., Trajdos, T. M., Zaucha, T., 2001, p.101), W. Walczak (Walczak, W., Lopatecki, K., 2013, p. 318), E. Solecki (Solecki Ostojka, E. L., 1884–1885) contain the depiction of the portal in photographs and drawings, 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.

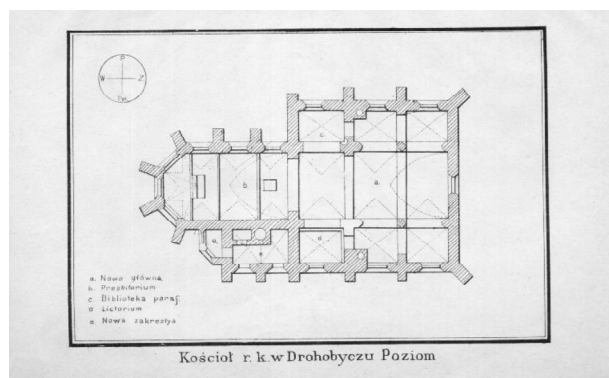
**The aim of this study is** to define the reasons and the consequences of the deterioration of the gothic alabaster portal of the parish church of St. Bartholomew in Drohobych.

## 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 ilustrowana: 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 ilustrowana: 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

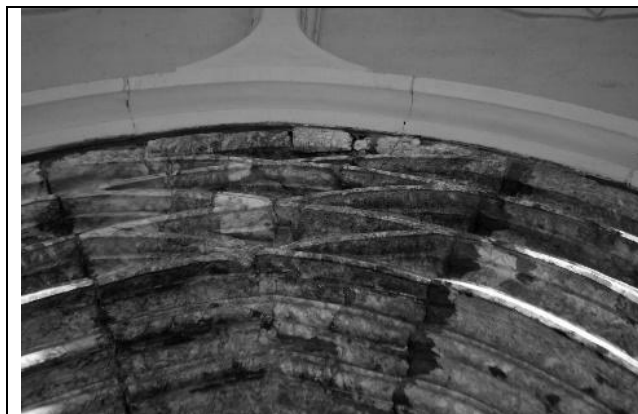
**Cracks:** three large cracks, which can lead to chipping off elements of the block

**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**

	<p>Alabaster molding block, consists of five ribs and intersecting crossings to the next block.</p> <p><b>State:</b> stable</p> <p><b>Losses:</b> not detected</p> <p><b>Deterioration:</b> 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</p> <p><b>Cracks:</b> 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.</p> <p><b>Contamination:</b> yellow spots, black patina, a part of the cement additions between the block the entrance door is in black, red and green colour</p> <p><b>Panels:</b> four alabaster panels of different colour – yellow, green, white</p> <p><b>Additions:</b> 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</p>
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**Block No. 11**

	<p>Alabaster molding block, consists of five ribs</p> <p><b>State:</b> unsatisfactory</p> <p><b>Losses:</b> not detected</p> <p><b>Deterioration:</b> 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</p> <p><b>Cracks:</b> six large deep cracks, which can lead to chipping off considerable part of the block. Numerous minor and small cracks.</p> <p><b>Contamination:</b> yellow spots, black patina, a part of the cement additions between the block the entrance door is in black, red and green colour</p> <p><b>Panels:</b> five alabaster panels of different colour – white, grey</p> <p><b>Additions:</b> three small cement additions on the ribs of the block, as well as between the entrance door and the</p>
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	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.

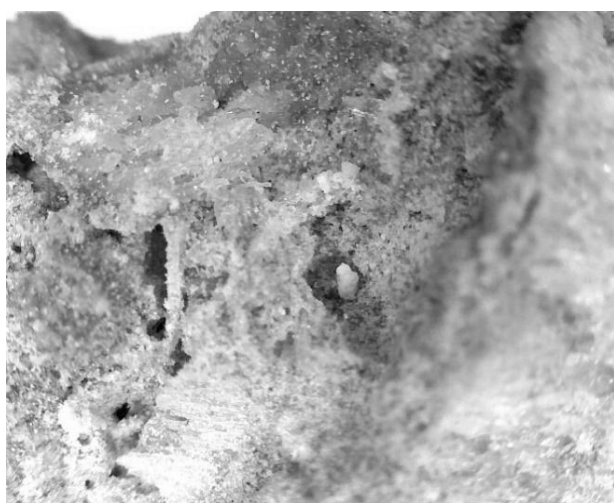
**Structure microanalysis of the alabaster stone samples and mortars of the portal of the parish Church of the Assumption of the Virgin Mary, Holy Cross and Bartholomew the Apostle in Drohobych.**

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).



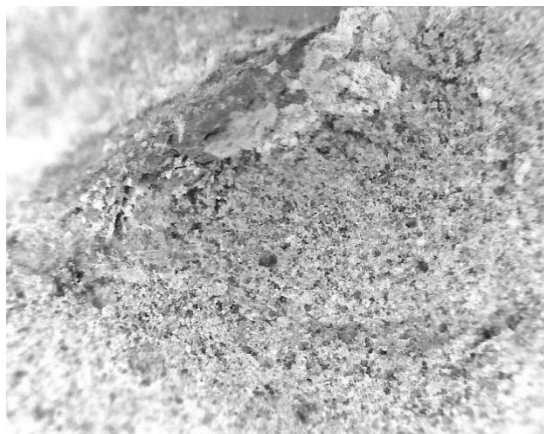
**Fig. 5.** Block 11. Sample XV. Clearly outlined structure of the alabaster crystals. Finely crystalline structure. Small content of clay impurities and veins of fibrous selenite



**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.

## References

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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