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Investigation and Restoration of the Black House on Rynok Square in Lviv

Badanie i konserwacja Czarnego Domu na Placu Rynek we Lwowie

Keywords: stone townhouse, Black House, technology of restoration, stone masonry, historical polychromy

Słowa kluczowe: kamienna kamienica, Czarny Dom, technologia renowacji, mury kamienne, zabytkowa polichromia

Introduction

The stone townhouse at 4 Rynok Square in Lviv is an architectural monument of national importance (protection number 326/3). It is located on the territory of the complex of the historic center of Lviv, placed on the list of UNESCO World Heritage Sites in 1998 (865 bis). In 2016, the Lviv Historical Museum received a grant as a part of the “Big Project” competition of the US Embassy for Cultural Preservation (AFCP) for the restoration of the Black House. The project coordinators were Petro Slobodyan, the head of the department of the Museum of Science and Technology, and Ruslan Koshiv, the head of the department of scientific and educational work and promotion of the same institution. Restoration work on the monument took place in the years 2016–2019.

This article presents historical information about the townhouse, the results of archaeological investigation of the courtyard, the conclusions of chemical and technological research of stone and polychromy, a description of architectural and structural solutions and features of the restoration process.

Prior to the start of the works, the monument was in an unsatisfactory condition: the lower part of the walls was very damp, the decorative carved details of the facade had a significant number of missing fragments, the attic and roof structures were in an alarming

condition. (Fig. 1, 2) Unique stone architectural details and sculptures were kept in the collection of the Lviv Historical Museum. However, they were not presented in a permanent exhibition.

In November 2019, the restored Black House was opened in Lviv. A lapidary was also opened on the ground floor. It includes 52 works of stone sculpture from between the twelfth and twentieth centuries, restored by graduates of the Department of Architecture and Restoration of the Lviv Polytechnic National University.

Historical information about the monument

The active development of the center of Lviv began after the re-granting of the Magdeburg rights to Lviv by Polish King Casimir III by a charter dated June 17, 1356.¹ The oldest mention of the house located on the site under study, dates back to 1405.² However, Łucja Charewiczowa wrote that the date 1452 was found on one of the stones in the cellar of the house.³ Łucja Charewiczowa (1897–1943)—a researcher of the history of Lviv and a guardian of the Lviv Historical Museum, in 1935 wrote a well-known and exemplary academic work *Czarna kamienica i jej mieszkańcy*.

In 1511, the house was destroyed by a fire. In 1519, Andrzej from Kiev bought an empty plot and built a house on it, which was damaged by a large fire in 1527.

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Fig. 1. Black House on Rynek Square in Lviv, view before the restoration, 2015; photo by O. Rybchynskiy.
 Рys. 1. Czarny Dom przy placu Rynkowym we Lwowie, widok przed renowacją, 2015; fot. O. Rybchynskiy.



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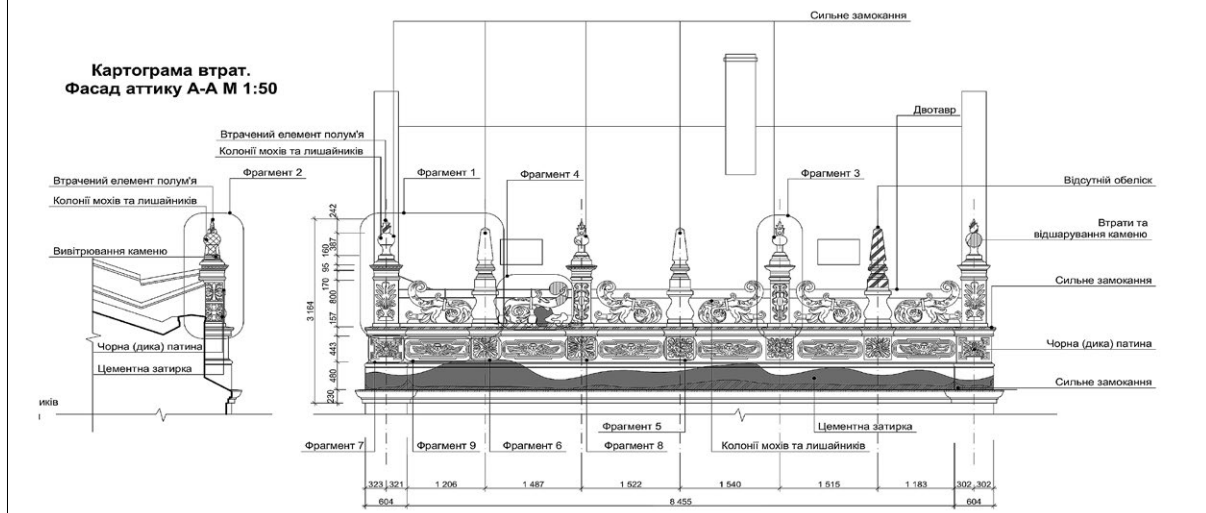


Fig. 2. Black House on Rynek Square in Lviv, attic before the restoration, damage cartogram, 2016; by O. Rybchynskiy and M. Hohon.
 Рys. 2. Czarny Dom przy placu Rynkowym we Lwowie, attyka przed renowacją, kartogram ubytków, 2016; opr. O. Rybchynskiy i M. Hohon.

The restored house burned down again in 1571.⁴ In 1577, architect Piotr Krasowski designed and supervised the construction of the next townhouse.⁵

In 1588–1589, Tomaso di Alberti, the new owner of the house, a merchant from the island of Chios, rebuilt it, presumably employing the services of architect Pietro Barbone, on two floors.⁶ In 1596, the house was bought by Jan Lorentzowicz and a pharmacy was opened here. In the first half of the seventeenth century, the Lorentzowicz family added a third floor.⁷

In 1675, members of the Lviv mason's shop found cracks and damage on the walls of the foundation of the house. Therefore, Marcin Anczewski, the new owner, urgently remodeled the townhouse. At his expense, sculptures were installed on the facade and the house was topped with an attic. On the reverse side of the attic there is a carved inscription "A. D. 1677 made by Gradowski."

Between 1716 and 1732, the townhouse belonged to Stefan Potocki, the mayor of Terebovlya. In 1732, it was bought by Franciszek Wiesznowski.⁸ In 1760, Dominik and Scholastyna Nikorowicz, Armenians from Lviv, became the owners of the house. Until the twentieth century, the house was owned by their heirs.⁹ During this period, carved wooden ceiling beams were covered with boards and plastered, carved stone window frames in the rooms were bricked up and plastered, a part of the indoor space on the ground floor was partitioned and narrow halls were left, stairs were remodeled, and new heating stoves were installed in the rooms. In 1835 the house was repaired at the expense of Kaetana Nikorowicz.¹⁰ In 1860, Mykoła Nikorowicz replaced the stairs and installed new stoves.

In 1883–1885, the house was thoroughly reconstructed according to the project of Michał Fechter and with the participation of the restorer Aleksander Piotrowski. The fourth floor was completed, the attic windows were changed, the outbuildings were built, the roofs were covered with galvanized sheet metal.¹¹

In 1911, Emil Roiński became an investor in the restoration of the house. The supervisor of the works was the architect Edmund Żychowicz. At that time, the facades were cleared of plaster, and the rooms were decorated with white stone carvings.¹²

In 1926, the city bought a house to create a historical museum of Lviv. In 1926–1929, restoration work continued on the facades and the premises under the direction of architect Wawrzyniec Dayczak. During that period, the artistic design of the facade was restored, windows were installed in place of the portal and gates, a porch was replanned, an office and a cash register were created, the roof coverings were replaced, damaged stone rusts were replaced with new ones, and new doors were installed.¹³

On September 22, 1929, the Historical Museum of the city of Lviv¹⁴ was ceremoniously opened here, which, despite changes in state borders, political regimes and names, still exists. In 1989–1990, documentation for the restoration of the facade was prepared.¹⁵

In the mid-1990s, the lost fragments of rusts, cornices and decorative elements were restored with cement mortar, and the facade was covered with the Caparol acrylic black paint.

Archaeological excavations in the courtyard of the Black House

In 2016–2017, the Lviv Archaeological Expedition of the Rescue Archaeological Service Research Centre of the Institute of Archeology of the National Academy of Sciences of Ukraine (Yuriy Lukomsky, Yevhen Tkach, Volodymyr Shyshak) performed an archaeological investigation. Four excavation pits were sited in the yard. Archaeological excavations revealed findings from between the thirteenth and the fifteenth century; a fragment of a wooden outbuilding that burned down in 1511; a fragment of a sewer collector from the 1880s; a part of a fifteenth-century brick building was discovered near the boundary wall.

Chemical-technological research

In 2016, Roman Gutsulyak (technologist-restorer, Candidate of Chemical Sciences, Kyiv) and Oleh Rybchynskyi (D.Sc. Arch., Professor of the Department of Architecture and Restoration, Lviv Polytechnic National University) performed an academic and technological survey of the building's stone facades. The purpose of the survey was to determine the condition of the stone decoration of the facade, to identify the nature and component composition of building materials for the development of technological recommendations for the restoration work.

As a result of field research, it was found that the front masonry of the walls was made of limestone blocks bound by lime-sand mortar; the condition of the masonry was generally satisfactory, except for areas of permanent soaking on the basement and adjacency to the gutters; almost the entire surface of the facade was covered with a solution of white cement; over time, this surface suffered local damage and parts were found to be missing; on the surface of several stone rusts, grey Portland cement additions were found, which caused damage to limestone; in many areas it was observed that the surface of natural stone was contaminated and had a black patina, so the masonry was painted several times with synthetic black paints. Rainwater drainage at the monument was found to be out of order, so the water dampened the walls and the stone surface collapsed. The walls of the plinth had high moisture content—up to 10–14%. Sculptures, attics, and carved parts were heavily soiled and displayed signs of significant damage due to atmospheric and biological factors. Stone cornices were heavily damp and contaminated by mosses and lichens.

Laboratory analysis of the selected samples showed that the stone decoration of the facade of the building was made of organogenic limestone (organogenic

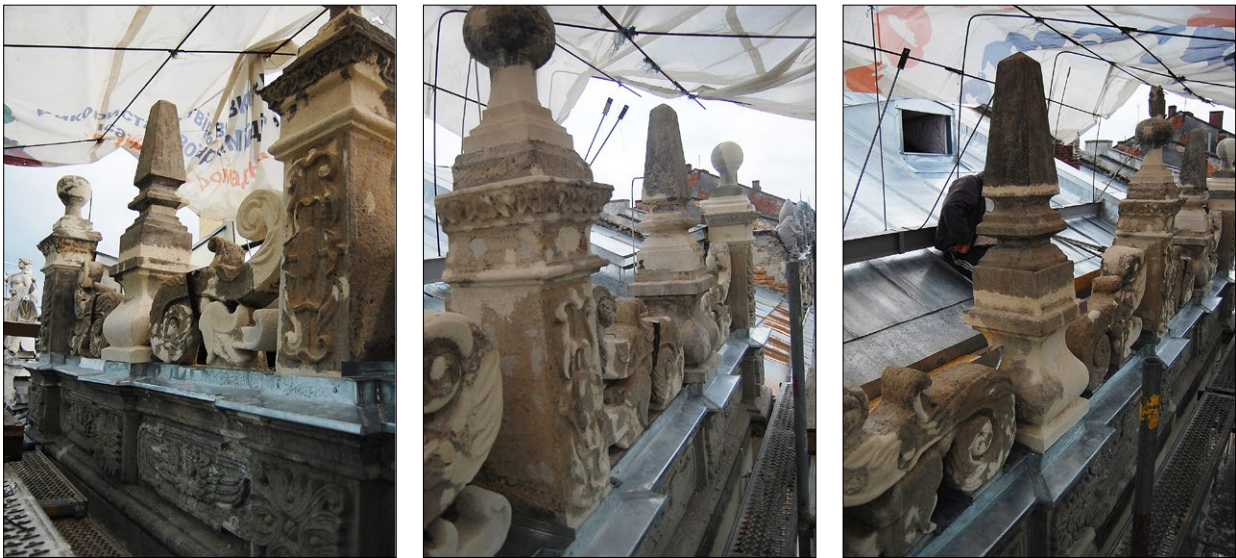


Fig. 3. Black House on Rynok Square in Lviv, attic after reproduction of losses, 2018; photo by O. Rybchynskiy.
Ryc. 3. Czarny Dom przy placu Rynkowym we Lwowie, attyka przed uzupełnieniem ubytków, 2018; fot. O. Rybchynskiy.

detritus and lithotamnium) of light brown and beige color, and of different textures. The stone showed significant surface erosion and technical damage. The facade was covered with a solution of hydraulic lime (or white cement). The facades were painted many times. Studies revealed oxides of zinc and titanium (residues of zinc and titanium whites). Several black stains were found. However, all the detected polychromy was not original because it had been applied to a surface cov-

ered with white cement, and therefore is the result of late repairs.

Architectural and structural solutions

The architectural design was developed by the following team of authors: Yuriy Dubyk (Associate Professor of Architecture and Restoration, Lviv Polytechnic National University), Igor Bokalo (Ph.D. Arch., Senior



Fig. 4. Black House on Rynok Square in Lviv, filling in of cracks and crevices, 2018; photo by O. Rybchynskiy.
Ryc. 4. Czarny Dom przy placu Rynkowym we Lwowie, uzupełnianie zarysowań i pęknięć, 2018; fot. O. Rybchynskiy.

Lecturer, Department of Architecture and Restoration, Lviv Polytechnic National University), Oleh Rybchynskyi (D.Sc. Arch., Professor of the Department of Architecture and Restoration, Lviv Polytechnic National University).

The design included: roof repair (repair of the wooden roof structure, the installation of roofing with titanium-zinc sheets, the installation of new drainage); the restoration of the existing stone floor from sandstone slabs in the lobby of the ground floor, the clearing of the vaults of the lobby and the corridor from stains, covering the vaults of the lobby and the corridor with lime paint; restoration of stone portals, wooden entrance vestibule and stairs; the arrangement of the inner courtyard of the monument (restoration of paving with sandstone slabs, restoration of the original entrance to the cellar of the main house and office, arrangement of a paved podium along the boundary wall for the organization of an exhibition-lapidary of white stone carved architectural details, installation of glass canopies along the boundary walls and over the stairs to the cellar). The rear facade of the townhouse was to be restored with a focus on windows and plaster, the stone walls of the plinth, brick walls, fragments of plaster and polychromy from the seventeenth century on the first floor.

The technology of restoration of the main facade consisted of the following parts: Attic. 1. Cleaning the surface of carved stone figures from dust, dirt, cement additives, traces of biological damage and paint coating. 2. Temporary dismantling of four attic volutes, their restoration on scaffolding was aimed at: cleaning the surface from dust, dirt, cement additives, biological damage and paint coating, the dismantling of parts in poor condition; replacement of leaking anchors; execution of a new anchoring from a stainless steel wire; bonding of cracked parts of the attic with epoxy glue and additional anchoring with stainless steel wire. 3. Removal of black patina from the stone using Remmers Fassadenreiniger-Paste gel and steam cleaning. 4. Removal of acrylic paint from stone with AGE gel and steam cleaning. 5. Coating of metal anchors with a rust converter, cleaning and preservation using a 10% solution of Paraloid72. 6. Injection of cracks with carbonate solution. 7. Clearing stone figures from destructed stone. 8. Structural fixing of the surface of stone figures with the Remmers KSE 100 and 300 strengthener on a silicic acid ester base. 9. Reproduction of lost parts of stone carving by the method of adding restoration carbonate mixtures. 10. Antiseptic treatment of stone figures with a solution of Remmers Adolit M flussig. 11. Structural strengthening of the attic by the Remmers KSE 300 strengthener on a silicic acid ester base. 12. Hydrophobic protection of the surface of the attic stone (Remmers Fungosil FC Hydrophobic liquid). 13. Replacement of metal clamps for the fastening of attic figures with stainless steel analogues.

Facade of the monument. 1. Cleaning the surface from paint coating, dust, dirt, cement additives and biodegradation. 2. Removal of black patina from stone

using Remmers Fassadenreiniger-Paste gel and steam cleaning. 3. Removal of acrylic paint from stone with AGE gel and wet cleaning. 4. Cleaning of the facade by sandblasting with IBIX apparatus and abrasive material with calcium carbonate. 5. Desalination the basement of the main facade by the method of extraction of salts; 6. Structural strengthening of the basement with the Remmers KSE 100 strengthener on a silicic acid ester base. 7. Clearing diamond rust from the destructed areas of stone. 8. Injection and gluing of cracks. 9. Anchoring of places for performance of additions by a corrosion-proof wire. 10. Fixing the lost parts of stone carving and rust by the method of adding the restoration carbonate mixtures. 11. Production of limestone inserts of several destroyed fragments of rust and plinth; 12. Structural fixing of a stone surface by the Remmers KSE 300 strengthener on a silicic acid ester base. 13. Antiseptic treatment of stone parts with a solution of the Remmers Adolit M flussig. 14. Hydrophobic proofing of the surface of the attic stone (Remmers Fungosil FC Hydrophobic liquid). 15. Dismantling (for laboratory restoration) and installation of five carved sculptures on the facade.

Features of the restoration process

The restoration of the house at 4 Rynok Square was complex, and was carried out by certified restorers, M.A. graduates of the Department of Architecture and Restoration of the Lviv Polytechnic National University: Natalia Garkot, Volodymyr Horyn, Roman Kolodiy, Daryna Bondarenko, Kateryna Plakhotniuk, Daryna Lesyuk. Oleh Rybchynskyi (Lviv Polytechnic National University) acted as the supervisor and contractor of restoration works.

Studies of the carved stone decor of the townhouse made it possible to determine in detail the previous additions made in the second half of the nineteenth and mid-twentieth centuries. These works were performed responsibly and at a high artistic level, displaying good quality workmanship. In particular, during this period, small volutes of the attic and studded obelisks were re-carved, the damaged diamond rusts of the second, third and fourth floors were replaced, additions to the sculpture of the Virgin and St. Martin were made, damaged fragments of the first floor rosettes were recreated, the window sill of the historical central entrance and the window located on the right were bricked up and decorated with rusts. High-quality restoration works from between the second half of the nineteenth and the middle of the twentieth centuries were monuments of restoration, so it was decided to preserve and conserve the discovered elements.

In the second half of the twentieth century, the facade of the townhouse at 4 Rynok Square was repaired at least twice. The works differed from the previous ones by poor workmanship Portland cement and cement wash with the addition of black paint and liquid glass were used in the repairs. Such an approach led

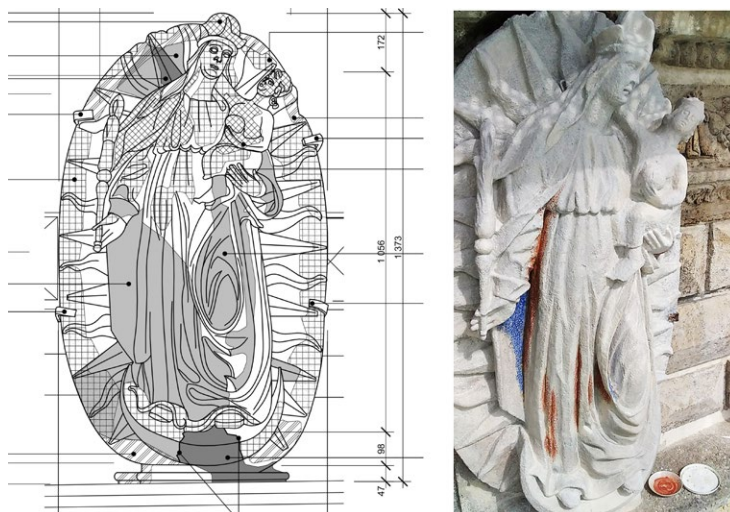


Fig. 5. Black House on Rynok Square in Lviv, sculpture of the Virgin and Jesus, damage cartogram, 2019; by O. Rybchynskiy and M. Hohon, photo by O. Rybchynskiy.

Ryc. 5. Czarny Dom przy placu Rynkowym we Lwowie, rzeźba Najświętszej Marii Panny i Jezusa, kartogram uszkodzeń, 2019; opr. O. Rybchynskiy i M. Hohon, fot. O. Rybchynskiy.

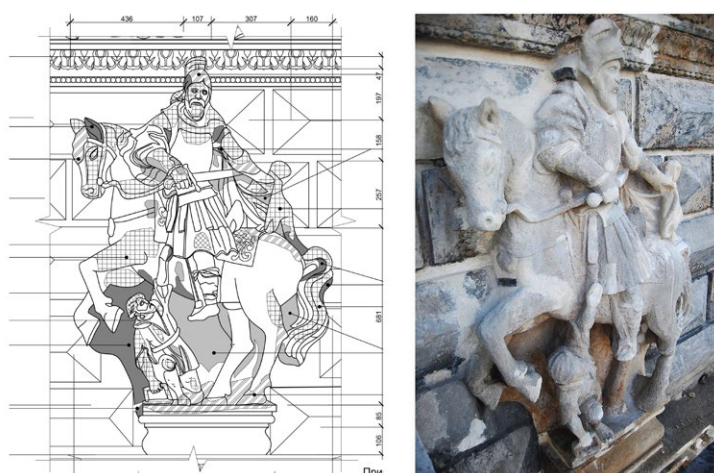


Fig. 6. Black House on Rynok Square in Lviv, sculpture of St. Martin, damage cartogram, 2019; by O. Rybchynskiy and M. Hohon, photo by O. Rybchynskiy.

Ryc. 6. Czarny Dom przy placu Rynkowym we Lwowie, rzeźba św. Marcina, kartogram uszkodzeń, 2019; opr. O. Rybchynskiy i M. Hohon, fot. O. Rybchynskiy.



Fig. 7. Black House on Rynok Square in Lviv, sculpture of St. Stanislaus, damage cartogram of losses by O. Rybchynskiy and M. Hohon, 2019; photo by O. Rybchynskiy.

Ryc. 7. Czarny Dom przy placu Rynkowym we Lwowie, rzeźba św. Stanisława, kartogram uszkodzeń i ubytków, 2019; opr. O. Rybchynskiy i M. Hohon, fot. O. Rybchynskiy.



Fig. 8. Black House on Rynok Square in Lviv, carved block in the wall behind the sculpture of St. Stanislaus, 2019; photo by O. Rybchynskiy.
Ryc. 8. Czarny Dom przy placu Rynkowym we Lwowie, kuty blok w ścianie za rzeźbą św. Stanisława, 2019; fot. O. Rybchynskiy.

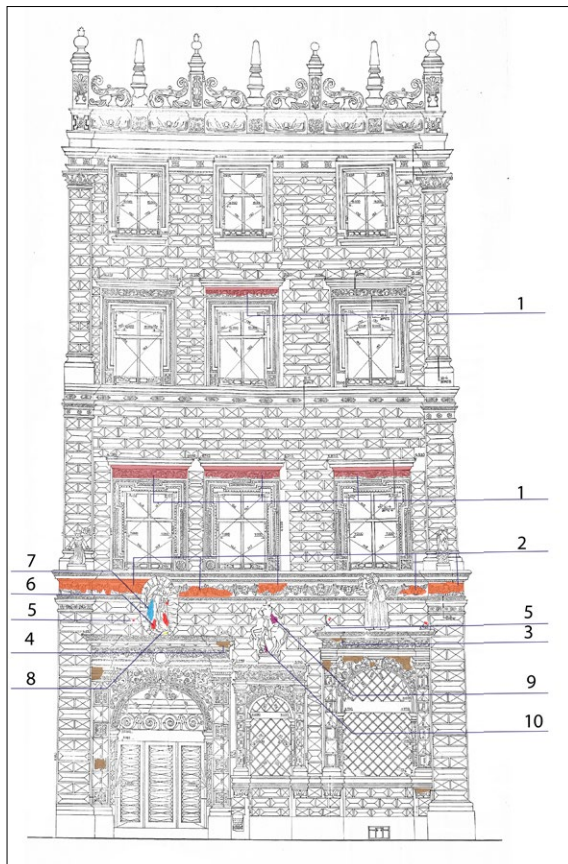


Fig. 9. Black House on Rynok Square in Lviv, discovery sites and small fragments of ancient polychromy, 2019; processing and photo by O. Rybchynskiy.
Ryc. 9. Czarny Dom przy placu Rynkowym we Lwowie, miejsca dokonania znalezisk, w tym drobnych fragmentów zabytkowej polichromii, 2019; fot. i obr. O. Rybchynskiy.

to the destruction of limestone surfaces and contributed to the unsatisfactory condition of the attic, diamond rusts, the mashing of carved window frames, and the loss of artistic appearance of sculptures and the coat of arms of the Anczewski family. In order to preserve the authenticity of the material and the high artistic value of the monument, it was decided to eliminate harmful and secondary parts made in the second half of the twentieth century.

The main precepts of the restoration were the careful treatment of the monument, the maximum preservation and reproduction of its authentic elements, the use of traditional technologies and materials.

At the beginning of the restoration work in May 2018, the white stone decoration of the main facade of the building at 4 Rynok Square was in a gradually deteriorating state. The roof was repaired first, as its unsatisfactory technical condition caused damage to the attic. From May to July 2018, the surface of the carved stone figures on the attic were cleaned from cement additions, biological damage, black patina and paint coating; the four volutes of the attic were dismantled and restored; those parts that risked to fall out were dismantled and glued; the rusted metal anchors of the fastening were replaced; new anchoring was made of stainless steel wire; cracks were injected with a carbonate solution; the reconstruction of decorative visual elements was performed using natural and artificial stone; the surface of the stone figures was fixed with a strengthener on a silicic acid ester base (Fig. 3). In May 2019, antiseptic stone treatment was performed, hydrophobic surface proofing was applied and new stainless steel attic fasteners were installed.

An investigation of the attic showed that the iron anchors that attached the white stone volutes to the parapet were heavily damaged because the mounting sockets were filled with sulfur.

From July to October 2018, and from June to September 2019, restoration and investigative work was carried out on the main facade of the monument. For two seasons, stone surfaces were cleaned of black patina, acrylic paint, dust, dirt, cement additives and biological damage;

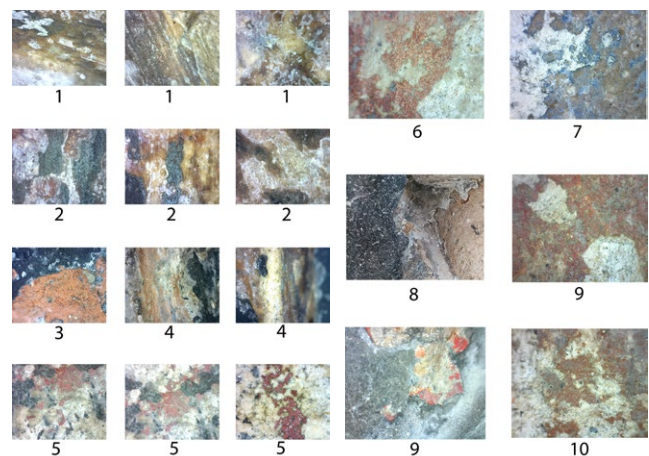




Fig. 10. Black House on Rynok Square in Lviv, view after restoration, 2021; photo by O. Rybchynskiy.
Ryc. 10. Czarny Dom przy placu Rynkowym we Lwowie, widok po renowacji, 2021; fot. O. Rybchynskiy.

the diamond rust was cleared from destructed areas of stone; cracks and crevices were filled in with injected material; additions were made of natural and artificial stone; stainless steel anchors were placed in the places of additions; the surface of the stone décor was fixed with a strengthener on a silicic acid ester base, antiseptic treatment of the stone and hydrophobic proofing were applied. Given the exceptional artistic value of the carved décor of window frames, they were cleaned using scalpels, plastic and brass brushes, and vapor generators. (Fig. 4)

In March–May 2019, two small sculptures, located on the corner pilasters of the second floor, were dismantled. A combination of conservation works and gluing of broken parts was performed in laboratory conditions. The final stage of the work entailed ensuring color integrity with a transparent azure.

From June to August 2019, conservation work was carried out on three large sculptures on the first floor. The areas of limestone stratification were structurally strengthened on the sculpture of the Virgin and Jesus; cracks were filled with injected material; the crowns,

the face of Jesus, fragments of draperies and rays were recreated. Cement additions were removed from the sculpture of St. Martin, cracks were filled with injected material, the head, arms, fragments of the cloak and horse harness were recreated out of artificial stone. The sculpture of St. Stanislaus was dismantled because a through-transverse crack in the figure could have caused it to fall (Fig. 5–7). Then it was found that there was a secondarily used carved block in the wall behind the sculpture, the composition of which was similar to the window sandrics of the second floor (Fig. 8). The sculpture of St. Stanislaus was cleared of black patina and cement grout, glued and arranged in its original place. Structural strengthening was carried out and the colors were touched up to ensure integrity.

During the restoration works on the main facade we were lucky to find areas and small fragments of ancient polychromy. The sandrics of three windows on the second floor and of the middle window on the third floors were brown. Areas of dark burgundy color, probably remnants of polymer, were found on the frieze with cherubs. Thus, we can assume that in the seventeenth century the reliefs of cherubs and garlands were covered with dry gold. Small fragments of red color were found on several diamond rusts on the first floor after clearing. Terracotta color was found in several places on the carved *mavreskas*, brackets and capitals of the ground floor pilasters, and the rosettes were of brown color.

The red color of the dress, the ultramarine color of the omophorion and the areas of preserved dry gold on the rays were discovered on the sculpture of Odigitria. Probably in the past, the crowns on the Virgin and Jesus were also gilded. Red areas on the cloak and brown area on the beggar's trousers were found on the figure of St. Martin (Fig. 9). After many meetings, the methodical council decided to cover the facade of the building with black glaze paint (Fig. 10).

Stone masonry, an oval window of the cellar's vents, an old exit to the courtyard and an alcove windowsill were discovered and preserved on the back facade.

Conclusion

The results of field and laboratory studies showed that the black color of the facade of the house was the result of chemical formation of black patina on the surface of the stone. The study of the initial painting of the facade should be continued.

In the future, it is necessary to conduct research and restoration of the walls and vaults of the entrance hall located under the surface of the sidewalk in Rynok Square. The results of these studies will reveal new information on the history of the Black House and Lviv in general.

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⁴ Ibidem, p. 47.

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⁶ Ł. Charewiczowa, op. cit., p. 57.

⁷ Ibidem, p. 126.

⁸ Ibidem, p. 107.

⁹ Ibidem, p. 114.

¹⁰ Ibidem, p. 131.

¹¹ Ibidem, p. 132–134.

¹² Ibidem, p. 134–135.

¹³ Ibidem, p. 135.

¹⁴ Ibidem, p. 136.

¹⁵ Архів інституту Укрзахідпроектреставрація, спр. Л-71-24, спр. Л-71-25, спр. Л-71-27, спр. Л-71-28, спр. Л-71-29, спр. Л-71-31.

Abstract

This article presents historical information about a townhouse located at 4 Rynok Square in Lviv, Ukraine, the results of an archaeological investigation of its courtyard, the conclusions of chemical and technological research of stone and polychromy, a description of architectural and structural solutions and features of the restoration process. Prior to the start of the works, the monument was in an unsatisfactory condition: the lower part of the walls was very damp, the decorative carved details of the facade showed traces of significant damage, the attic and roof structures were in disrepair. During the restoration of the facade, the main precepts of the restoration were the careful treatment of the monument, the maximum preservation and reproduction of its authentic elements, the use of traditional technologies and materials. During the restoration works on the main facade, areas and small fragments of historical polychromy were fortunately discovered and were all preserved. The results of field and laboratory studies showed that the black color of the facade of the house was the result of the chemical formation of black patina on the surface of the stone. The study of the original paint layers of the facade should be continued.

Streszczenie

Artykuł przedstawia informacje historyczne o kamienicy zlokalizowanej pod adresem Plac Rynek 4 we Lwowie, na Ukrainie, a także wyniki badania archeologicznego jej dziedzińca i wnioski z badań chemiczno-technologicznych kamieniarki i polichromii oraz opis architektonicznych i konstrukcyjnych rozwiązań i cech procesu renowacji. Przed rozpoczęciem robót zabytek znajdował się w stanie niezadawalającym: dolna część ścian była mocno zamoknięta, ozdobne rzeźbione detale elewacji miały ubytki, a konstrukcja strychu i dachu były w złym stanie technicznym. Podczas prac renowacyjnych nad fasadą główne zasady konserwacji uwzględniały zachowanie i odtworzenie jego autentycznych elementów oraz wykorzystanie tradycyjnych technologii i materiałów. Podczas robót renowacyjnych prowadzonych na głównej elewacji odnaleziono i całkowicie zachowano drobne i większe fragmenty zabytkowej polichromii. Wyniki badań terenowych i laboratoryjnych pokazały, że czarny kolor elewacji budynku był wynikiem chemicznego wytworzenia się czarnej patyny na powierzchni kamienia. Należy kontynuować badania pierwotnych warstw malarskich elewacji.