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Sound, silence and the difficult heritage in the realms of remembrance: The case of Europe and Asia–Pacific region
This article addresses the role of sound and silence in different types of memorials – monuments, memorials and museums. It shows how silence plays an important role which can be pierced by a sudden resounding sound – be it a whisper or the ringing of a bell, or oil coming out of a wreck. The authors focused their analysis on memorials in the Asia-Pacific region, Europe and Israel, which are inextricably linked to a difficult heritage. The aim of using sound in a space commemorating tragic events is to appeal to the visitor's emotions, as well as to create a specific narrative.

Keywords: memorials, Pearl Harbor, Holocaust, Japan, Israel

Introduction

Every country celebrates the memory of the past events via memorials, including museums in which the artefacts are presented to uphold remembrance of past events. Decisions about what information should be transferred in a given place transform artefacts into heritage which can which can be both the enabler and the product of diplomacy.[1] Different cultures present their heritage to achieve different goals, treating it as a history to be told and passed on to future generations. Again, these stories may evolve and varying meanings may be ascribed to them depending on the period. But one thing remains unchanged: the longstanding and widespread belief that "places should seek to inscribe what is significant in their histories, and especially their past achievements" [2] onto the topos.

[1] HUANG, Shu-Mei; LEE, Hyun-Kyung. Difficult heritage diplomacy? Re-articulating places of pain and shame as world heritage in northeast Asia. In: *International Journal of Heritage Studies*, 25(2), 2019, p. 144.
[2] MACDONALD, Sharon. *Difficult heritage: Negotiating the Nazi past in Nuremberg and beyond.* Abingdon: Routledge, 2010, p. 2.

When remembering specific events or their participants, we use various tools. When we create memorials, we use, among others, architectural solutions, arrangements of space, symbols and the construction of narrative lines. Another tool is the use – or absence – of sound. We are invited by silent places to reflect; or, in places where silence is intentionally broken, this silence and sound have specific role to play. They can comment on or supplement information, they can create atmosphere, and they can intensify or calm emotions. Silence and sound can become part of the narrative and an important element of visual creation. They allow us to immerse ourselves in the recalled past and come closer to reality and history.

The overall aim of the article

In this article we analyse the role of sound memorials and sound in memorials, as well as sound and silence in the context of realms of memory[3], in two specific regions: Europe and Asia–Pacific. Those places are strongly connected to difficult heritage – the Holocaust, Japanese aggression in the first part of the twentieth century (the cases of Korea and the United States (Pearl Harbor)), and also the atomic disaster in Hiroshima, Japan. In Europe we focus on Holocaust. Because of this, as a case we analyse not only locations in the European continent but also in Israel, where many citizens' memories are linked to Europe.

The article addresses soundscapes and provides analysis of how they are used not only to affect visitors but also in overall heritage diplomacy. We discuss the matter of "legitimate sound" which, Bubaris claims, creates a "multisensory dynamic environment that rearranges the relation of the visitor to the exhibitions".[4]

The authors visited all the sites presented in the analysis. As well as gaining their subjective impressions of the analysed memorials, they collected data in the form of academic articles and, inter alia, information on government and local government websites, with the aim of keeping the analysis as objective as possible.

Difficult Heritage and the heritage diplomacy

Since heritage itself is considered as both an enabler and a product of diplomacy,[5] it has in some cultures, for example in China, "become an important vehicle in the service of cultural nationalism".[6] The notion of heritage can be both tangible and intangible. As Sharon Macdonalds notes:

> Heritage is a material as well as a symbolic practice. [...] This materiality matters. [...] Despite the claims of some of those involved in preservation debates, it is only rarely the case that material factors alone fully govern the fate of material culture. Rather, human decisions about what to do with a building, including whether to neglect it entirely or fail to secure its foundations against subsidence, are co-determinant in shaping the land- or city-scape.[7]

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[3] NORRA, Pierre. *Realms of Memory: Rethinking the French Past, Vol. 1 – Conflicts and Divisions*. New York: Columbia University Press. 1996.

[4] BUBARIS, Nikos. Sound in museums – museums in sound. In: *Museum Management and Curatorship*, 29(4), 2014, pp. 392–393.

[5] Ibidem.

[6] HUANG; LEE. Difficult heritage diplomacy?..., p. 147. See more: GUO, Yingjie. *Cultural nationalism in contemporary China*. London: Routledge, 2004.

[7] MACDONALD. *Difficult heritage*…, p. 26.

This notion is strongly associated with "traumatic and painful processes by which heritage and identity are formed".[8] Individual countries decide what is meaningful in their history and what should be displayed. This heritage, frequently described as "difficult", can be also defined as "worthy" and it can change depending on various decisions, including political ones.[9] Therefore we can refer to "the politics of heritage" which focuses on contestation, dissonance and conflict.[10] "Difficult heritage" itself is considered a historical and ethnographic phenomenon, often treated as a kind of "assemblage".[11] It is defined as "a set of processes whereby cultural and natural pasts shared between and across nations become subject to exchanges, collaborations and forms of cooperative governance"[12]. Referring to the practical usage of heritage within each country's policy, we should discuss the question of heritage diplomacy, a term which stands separate from cultural diplomacy within the definitions of diplomacy.[13] Heritage diplomacy is more extensive, incorporating "the export or projection of a particular cultural form" as well as bringing into focus "bi- and multi-directional cultural flows and exchanges", becoming in the process a non-human actor in international and political relations.[14] Artefacts which commemorate a difficult heritage are often categorised in an awkward way due to discipline-based classifications that consider folk art to be "timeless" rather than historical, as well as the unwillingness of museum curators to raise inconvenient issues.[15]

Soundscapes, museums and types of sounds in material heritage

The term "soundscape" refers to both the sound that surrounds us and to a construct which is "designed to make sense of that world".[16] The term was coined in the late 1960s by R. Murray Schafer.[17] As DeJong claims, soundscapes can be used to serve the cause of "sentimental education".[18] Soundscapes are created from a distribution of sound within a given space; their perception depends on the sensory point of view, as well as on distance from the sound source.[19] Political anthropologists describe soundscapes as not only sound, but also "a place of production, staging, consumption, reproduction and transformation, namely a place of power and politics."[20]

With regards to their use in the museum space, soundscapes are used to promote sentimental education, enabling difficult aspects of history to be assimilated, moving audiences "to a more

[8] HUANG; LEE. Difficult heritage diplomacy?..., p. 144. LOGAN, William; REEVES, Keir (eds.). *Places of pain and shame: dealing with 'difficult heritage'*. Routledge, 2008. MACDONALD. *Difficult heritage*…

[9] MACDONALD. *Difficult heritage*…, p. 2.

[10] WINTER, Tim. Heritage diplomacy. In: *International Journal of Heritage Studies*, 21(10), 2015, p. 998.

[11] MACDONALD. *Difficult heritage*…, p. 4.

[12] WINTER, Heritage diplomacy…, p. 1007.

[13] Ibidem.

[14] Ibidem.

[15] LEHRER, Erica, et al. Awkward Objects of Genocide. In: *Anthropology News*, 2017, 58.1: 243.

[16] JACOBS, Annelies. Barking and blaring: City sounds in wartime. In: *Sounds of War and Peace: Soundscapes of European Cities in 1945*, 10, 2018, p. 12.

[17] DE JONG, Steffi. Sentimental Education. Sound and Silence at History Museums. In: *Museum and Society*, 16(1), 2018, p. 91.

[18] Ibidem, p. 89.

[19] Ibidem, p. 94.

[20] VELASCO-PUFLEAU, Luis; ATLANI-DUAULT, Laëtitia. Sounds of survival, weaponization of sounds: Exploring sonic lieux de mémoire. In: *Violence: An international journal*, 1(2), 2020, p. 266.

abstract level"[21]. They are also linked to a textual approach encompassing the analysis of spatial narratives "set up by the relationship of one gallery or object to another" or consideration of "the narrative strategies and voices implicit in labelling, lighting, or sound."[22]

The lack of silence makes the sound act as a significant echo in the visitors' world – "the Voice", as defined by Bubaris, revealing the authentic essence of the exhibition.[23] Moreover, music and soundscapes can provide social mediation of difficult themes.[24] Sound may add to the tangible experience of museums, especially those that focus on the experience of war.[25] Sound should be studied in an interdisciplinary way. From the early days of museums, display rooms were acoustically sealed and isolated from the exterior world.[26] Gradually, sound started to be added as part of the exhibition in order to move the spirit of visitors. Exhibition-makers began to use sound reproduction, volume, spatialization and original sound recordings (such as announcements, radio programmes, etc.) to engage audiences.[27] As Bubaris describes, this meant that

> sound is no longer limited, literally and metaphorically, to the voice that guides the visitor to uncover the hidden truth of the exhibition. [...] the vibratory and spatiotemporal properties of sound may stimulate the visitor–exhibition interaction, providing the visitor with a sense of immediacy and participation in experiencing the museum exhibition as a "live event".[28]

Museums can serve as places which present history that should not be repeated, frequently carrying a pacifist message, or they can serve as a space where difficult heritage is presented as a tool for heritage diplomacy. They can also fulfil both options.

Steffi de Jong proposed a typology for sounds presented in the museum and places of remembrance, splitting them into original sound documents and sound reproduction.[29] Original sound documents

> are often mixed with other, reproduced, sounds. When they are not combined with other sounds, they are generally played in the open, their sound bleeding into other soundscapes and mingling with sounds made by visitors. Like reproduced sounds, original sounds are used to give visitors an immersive experience. Often, the nature of the sounds is not made explicit either.[30]

Sound reproduction is primarily carried out sound engineers, who produce sounds that researchers and curators are confident existed at a specific point in time, commissioned as an

[21] DE JONG, Sentimental Education…, p. 95.
[22] MASON, Rhiannon. Cultural theory and museum studies. In: MACDONALD, Sharon (ed.). *A companion to museum studies*. Oxford: Blackwell Publishing, 2006, p. 26.
[23] BUBARIS, Sound in museums…, p. 392.
[24] BENDRUPS, Dan. War in Rapanui music: a history of cultural representation. In: *Yearbook for traditional music*, 2006, 38: 1, p. 31.
[25] JACOBS, Barking and blaring..., p. 12.
[26] BUBARIS, Sound in museums…, p. 391.
[27] DE JONG, Sentimental education…, p. 91.
[28] BUBARIS, Sound in museums…, p. 393.
[29] DE JONG, Sentimental education…, pp. 91–93.
[30] Ibidem, p. 91.

indispensable part of the exhibition.[31] Sound can be used in a diegetic and non-diegetic way. Diegetic refers to sounds that exist or occurring within the narrative world of the exhibition and the environment it reproduces.[32] Non-diegetic use of sound refers to recording personal documents, such as memories or diaries, in the manner of a "truthful reproduction"[33]. Recorded voices can create a kind of "oratorio" designed to give the impression that witnesses who lived through the event are speaking. Their statements – presented without a storyline and often supported by background music – become the "music" of the exhibition.[34] These sounds and accompanying images evoke memories, helping give the space a human dimension and engaging audiences.[35] When sound is used as part of a virtual museum, without the physical experience of visiting the building, this impression is weakened.[36] Moreover, exhibitions in which sound is provided only via special devices, not as an ongoing part of the exhibition, mean that sound is no longer an essential part of the tour. Visitors can decide for themselves whether to make the sound the part of the visit by choosing to use digital devices such as audio guides, during the visit.[37]

Silence and memorials

The past is recorded in us not only in the form of remembered images but through other sensory traces, including sounds. Awareness of this has led designers to not only visually recreate past events at memorial sites, but to attempt to influence the audience on other levels, including through the use of audio. We know that sounds can act as specific stimuli to evoke memories or generate various images in the imagination. Thanks to this, sounds can engage people emotionally, including those visiting museums or a monument.[38] Sound can be used in such spaces to stimulate feelings or trigger memories among visitors to memorial sites. Sound is a subtle medium that can help generate images and scenes in our imagination.[39] This process is supported by what Cathy Lane and Nye Parry call "sonic memory theatres": "The musical work can be seen as a journey through a sound space. Personal memories and associations are triggered in the minds of the listeners, both in response to the material and to the structural arrangement of that material."[40]

This influence can be exerted not only by emitting specific sounds but also by isolating the audience from sounds and creating silence. Both variants might involve both spontaneous or carefully arranged situations. Memory studies and museum studies largely neglect sound, mentioning only the minute's silence associated with remember the dead.[41] We understand

[31] Ibidem, p. 92.
[32] BUBARIS, Sound in museums…, p. 394.
[33] DE JONG, Sentimental Education…, p. 93.
[34] POSŁUSZNA, Joanna. Dźwięk jako terapeutyczna i duchowa forma upamiętniania oraz przywracania pamięci. In: *Annales Universitatis Mariae Curie-Skłodowska, sectio J–Paedagogia-Psychologia*, 30(1), 2017, p. 89.
[35] Ibidem, p. 90.
[36] BENNETT, Tony. Civic seeing: museums and the organization of vision. In: *A companion to museum studies*, ed. Sharon Macdonald, Oxford: Blackwell Publishing, 2006, p. 307.
[37] More cases see: HJORTKJÆR, Kamilla. The Sound of the past: sound in the exhibition at the Danish Museum Mosede Fort, Denmark 1914–18. In: *Curator: The Museum Journal*, 62(3), 2019, p. 460.
[38] POSŁUSZNA, Dźwięk jako terapeutyczna…, pp. 90–94.
[39] MARSH, Caryl. In Praise of Sound at the Royal Ontario Museum. In: *Curator: The Museum Journal*, 1998, (41)1, p. 54.
[40] LANE, Cathy; PARRY, Nye. The Memory Machine: Sound and memory at the British Museum. In: *Organised Sound*, 10(2), 2005, p. 142.
[41] DE JONG, Sentimental Education…, p. 89.

that silence may be the result of speechlessness, whether through an individual's choice or as a consequence of a specific will being imposed on a human being (such as a ban on speaking and expressing thoughts). Here we see the interpenetration of ideas – silence and speechlessness – and observe that speechlessness may represent a conscious decision to refrain from speaking. The act of speechlessness, therefore, assumes the presence of a human being. The situation is different when silence exists without human intervention.[42] Either way, both silence and speechlessness in the individual and their social dimensions are important elements of communication.[43]

There can be various sources of silence. Their diversity is underlined by Colum Kenny, who discusses this issue in his work on silence and highlights its correlations with speechlessness.[44] He notes that silence / speechlessness may be an effect of wisdom or virtue: in such cases it can reflect reluctance to make an unambiguous, harsh judgement. It can signify an attempt to understand reality and a defence against expressing opinions too hastily. Silence may also result from hesitation to speak due to modesty, or speechlessness chosen in the face of danger or misfortune; in these cases it represents an attempt to wait things out and avoid a threat. Another source of silence is a situation in which emotions and feelings are difficult to express in words, leaving only meaningful silence. This happens when we are impressed by great beauty or wisdom, but also when we feel terror, disgust or guilt. There is yet another situation when silence is born from the speechlessness of strong personalities who do not need words to command respect. Conversely, there are situations when weak personalities remain silent because they do not feel able to speak or do not feel they have the right to speak out.[45]

Silence may also originate from a feeling of contentment – a person is silent because they feel physically satisfied, healthy and pleased and do not want to disturb this state in any way (even with words). We can also observe idle silence, that is, silence for which it is difficult to find a purpose or reason. In this catalogue, Colum Kenny points out two more areas which are important from the perspective of our considerations. The first is solemn silence, that is, the silence we celebrate in liturgical, contemplative and meditative contexts. The second is dead silence, which we can associate with the reality of transience and death. "There is nothing quite as powerfully silent as a loved one who has just passed away"[46]. In this context, Teresa Olearczyk notes that

> speechlessness most often appears as one of the ultimate, boundary means of expression – one is silent in the face of a mystery, with silence one points to something which cannot be expressed in words, when we reach the Wittgensteinian boundary of our inner world.[47]

We notice the presence of both of these last two dimensions – contemplative and associated with boundaries – when looking at commemorations of the victims of World War II, especially in relation to the history of the Holocaust. In such spaces, we experience what Maria Sławek describes:

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[42] OLEARCZYK, Teresa. Antropologiczne aspekty milczenia. In: *Teologia i Moralność*, 1, 2023, p. 66.
[43] KENNY, Colum. *The Power of Silence. Silent Communication in Daily Life*. London-New York: Routledge, 2018, p. 69.
[44] Ibidem, pp. 6–44.
[45] Ibidem, pp. 6–39.
[46] Ibidem, p. 44.
[47] OLEARCZYK, Antropologiczne aspekty..., pp. 76–77.

> Silence can have a heavy weight; it can be saturated with meanings or it can be completely empty. […] There are places and situations in which silence seems to be the most appropriate sound.[48]

We often express this belief by observing practices applied at the sites of former concentration and extermination camps. Silence often seems to be the only possible response to the immensity of the cruelty which has permanently marked these places.

It should be emphasised, however, that silence means the absence of audible sounds; it does not mean complete emptiness or a lack of movement or action. We see and feel it clearly, for example, in musical structures, where a moment of silence moves us forward and makes us wait for what is about to happen.[49] In a broader sense, we can also see a kind of dynamic character in silence, because silence can be a source of spiritual experience.[50] It can strengthen concentration and calm inner emotions, imagination and will. In many religious traditions, cultivating inner silence is necessary for contemplation.[51] When we analyse various religious traditions, we find silence as a kind of network connecting the individual with the Absolute or as a place where God's will is fulfilled, or, at least, a place, where one can listen to this will and recognise it.[52]

Kenny notes that silence was an important aspect of the rites of various religious mysteries in the ancient world. It was embedded in the essence of the ceremonies of that time. Initiates were expected to remain silent about what they experienced while taking part in festival celebrations.[53] Silence was a sign of waiting, of being open to listening to the message coming from beyond human reality. The Greeks, for example, developed a form of mysticism the essence of which was silent experience, rising above all images and ideas and achieving peace and inner silence.[54] Priestly documents from ancient Egypt and Mesopotamia often included "orders of silence". Silence was also praised by the Jewish sages and it has an important place in the Jewish religion. Jewish texts teach that silence can mean waiting for the moment when wiser people will speak. "Being silent in the face of God can be a sign of reverence or fear or of expectation that He is about to communicate by word or deed."[55]

The correlation between speechlessness and silence and religious discipline was also recognised by early Christians. For them, silence meant readiness to listen and learn the truth. In many cultures, silence is also considered one of the conditions of penance.[56]

Nowadays, we cannot perceive silence only as the absence or lack of acoustic stimuli. In the context of our considerations we see it as a creative space, releasing the possibility of intellectual

[48] SŁAWEK, Maria. Skrzypce w Auschwitz. In: *Zagłada Żydów. Studia i Materiały*, 17, 2021, p. 629.
[49] DOCTOR, Jenny. The texture of Silence. In: *Silence, Music, Silent Music*, ed. Nicky Losseff, Jenny Doctor, London, New York: Routledge, 2016, p. 19.
[50] GLEŃ, Adrian. Wiersze u-ciszone. Prolegomena do badań nad ciszą w wierszach Juliana Kornhausera. In: *Er(r) go. Teoria – Literatura – Kultura*, 1, 2011, p. 251.
[51] JACKO, Jan Franciszek. Cisza jako pojęcie analogiczne. Próba analizy ontologiczno-semiotycznej. In: *Przestrzeń ciszy. Przestrzenie wizualne i akustyczne człowieka. Antropologia audiowizualna jako przedmiot i metoda badań*, ed. Justyna Harbanowicz, Agnieszka Janiak, Wrocław: Wydawnictwo DSW, 2011, pp. 18–20.
[52] KENNY, The Power of…, p. 69.
[53] Ibidem, p. 199.
[54] ARMSTRONG, Karen. *Historia Boga. 4000 lat dziejów Boga w judaizmie, chrześcijaństwie i islamie.* Warszawa: Świat Książki, 1996, p. 237.
[55] KENNY, The Power of…, p. 195.
[56] Ibidem, pp. 199–207.

or spiritual activity. In this case, the absence of sound opens the way to the emergence of other intellectual or emotional forms.[57] Thus, silence becomes the space in which commemoration takes place. It allows memory to work and to experience processes related to remembering specific events or people. This may be both an individual and collective experience.

Difficult heritage in Europe and Asia–Pacific: selected cases of sound in museums and memory sites

In European twentieth-century history and the difficult heritage associated with this period, war experiences are important. Experiences from the Holocaust undoubtedly raise vivid images in the mind. This can be clearly seen in many monuments that remember the victims of the genocide committed by Nazi Germany, with the support of its allies and collaborators. Today, memorial sites for millions of European Jews exist in European countries and beyond.

With regard to the history of East Asia in the first half of the twentieth century, this article mainly analyses memorials associated with the impacts of Japanese foreign policy. Starting with the expansion of Japanese influence on the Korean peninsula from the early twentieth century, followed by the incorporation of Korea into Japanese territory in 1910, warfare on the Asian continent in the second half of the 1930s and, finally, the attack on the US military base at Hawaii's Pearl Harbor in December 1941, the memory of the past in many parts Asia is often linked to Japan's policies at this time.

Children's Memorial – Yad Vashem in Jerusalem, Israel

We can see the important role of sound in commemorative space in one of the memorials located in the grounds of the Holocaust Martyrs' and Heroes' Remembrance Institute, Yad Vashem, in Jerusalem (The World Holocaust Remembrance Centre). This is the Children's Memorial (Fig. 1), which recalls the fate of the Holocaust's 1.5 million youngest victims. The initiators of its construction were Abe and Edita Spiegel, whose son, Uziel, was murdered in the gas chamber at Auschwitz as a two-and-a-half-year-old child.[58] Opened in 1987, the monument, which was designed by architect Moshe Safdie, is a grotto, a kind of underground cave entered directly from the garden surrounding the Yad Vashem Institute. In the darkened space, the light of a candle – which, according to Jewish tradition, commemorates the dead – plays a key role. A single flame is reflected and multiplied endlessly in hundreds of mirrors that line the walls, floor and vault.[59] As Paul Goldberger noted, "the sense is of blackness, deep and limitless, yet illuminated by tiny points of hope".[60] Entering a space arranged in this way, we may have the impression that we are under a starry sky. Visitors to the site are invited to enter a space that Paolo Coen calls "a galaxy of sorts of the souls of the murdered children".[61]

The contemplative nature of the space is supported by the sound elements used here. The first is a chant that evokes associations with a mournful lament. The male voice we hear in the recording played here belongs to American musician Paul Horn and comes from the album

[57] Ibidem, p. 67.

[58] *Yad Vashem: Moshe Safdie – Architektur der Erinnerung*, accessed 21 May 2023, https://www.israel-reiseleiter.com/post/yad-vashem-moshe-safdie-architektur-der-erinnerung.

[59] GUTTERMAN, Bella, SHALEV, Avner (ed.). *To Bear Witness. Holocaust Remembrance at Yad Vashem*. Jerusalem: Yad Vashem, 2005, p. 312.

[60] GOLDBERGER, Paul. *Rebuilding Jerusalem*. In: *Moshe Safdie*, ed. Wendy Kohn, Mulgrave: Images Publishing, 2009, p. 20.

[61] COEN, P. *Moshe Safdie at Yad Vashem: Architecture, Politics, Identity*. In: *Pólemos*, 1(13), 2019, p. 12.

"Inside the Great Pyramid", released in the 1970s, which contains recordings of Old Testament psalms performed inside the Egyptian pyramid of Cheops. The spacious sound, the acoustic recording, the hypnotic sound all promote meditation and reflection, and the interior of the monument reinforces the impression that the sound emitted here comes from deep within the earth. These were the intentions of the creators of this memorial.[62]

Complementing this soundtrack are the names of children murdered during the Holocaust, slowly read out by voiceover. This is information taken from documents and testimonies collected since the mid-1950s in the nearby Hall of Names gallery[63] (Holocaust History Museum, Yad Vashem). They clearly show the many countries of origin of those whose lives were brutally interrupted by the criminal policies of Nazi Germany. This picture is constructed not at the level of statistics depicting the scale of the drama but through the individual dimension of collective experience.[64]

Through the use of person-specific data, the space not only appeals to sensory impressions, but also – by means of a factual layer – connects to reality.

The author of the installation, Moshe Safdie, describes it as follows: "The reading is done by several voices. Name, age, place of birth. English and Hebrew. That is all. A nonstop whisper in the darkness."[65]

We can conclude that an encounter with the monument in Jerusalem implies not only a presence inside but also a specific experience. According to Neuman, "Safdie's idea was to keep commemoration simple and direct by creating an experience in space to which no visitors could remain indifferent."[66] The "envelopment" of darkness, light and sound has an effect on the senses of visitors to the memorial, making remembering the victims of the Holocaust not only a cognitive process but one that is heavily immersed in the emotional sphere. The darkness into which the visitor must sink when entering the interior of the monument undoubtedly sharpens the perception of all stimuli – including sounds.[67]

Monument to Children – Victims of the Holocaust at the Jewish Museum in Vilnius, Lithuania

Sound is an essential element of the interactive memorial dedicated to the victims of the Holocaust found in the Museum's Tolerance Centre, one of the buildings of Vilna Gaon Jewish State Museum (Fig. 2). This symbolic installation is the centrepiece of the permanent exhibition on child victims of the Holocaust in Lithuania ("Rescued Lithuanian Jewish Child Tells About The Shoah"), which has been on display there since 2009. It is a small, darkened

[62] SAFDIE, Moshe. *If Walls Could Speak: My Life in Architecture*. New York: Atlantic Monthly Press, p. 190; SAFDIE, Moshe, *The Architecture of Memory.* In: *Yad Vashem. Moshe Safdie – The Architecture of Memory,* Joan Ockman, Moshe Safdie, Avner Shalev, Elie Wiesel, Jerusalem: Yad Vashem, 2011, p. 92.

[63] HAREL, Dorit. *Facts and Feelings. Dilemmas in Designing the Yad Vashem Holocaust History Museum*. Jerusalem: Yad Vashem, 2010, p. 92.

[64] *Children's Memorial*, accessed 19 May 2023, https://www.yadvashem.org/remembrance/commemorative-sites/children-memorial.html.

[65] SAFDIE, Moshe. *If Walls Could*…, p. 191.

[66] NEUMAN, Eran. *Shoah Presence: Architectural Representations of the Holocaust*, Abingdon-on-Thames: Routledge, 2016, p. 80.

[67] Read more about Children's history presentation at Yad Vashem: ZABORSKI, Marcin. Children and the politics of memory: analysis of the museum narrative at the Yad Vashem Institute. In: *Athenaeum. Polskie Studia Politologiczne*, 2023, 80(4), pp. 60–79.

room that you can enter as you explore further parts of the exhibition. A path leads to it, setting the rhythm of the tour.

Utilising light, image and sound, the space of the monument has been designed as an engaging place that encourages visitors not only to reflect but also to take a specific action referring to the Jewish tradition of cherishing the memory of the dead by placing a small stone in the space of this memorial. Undertaking this act illuminates the space of the memorial, allowing the visitor to see dozens of faces of the Jewish children featured in the photographs presented there.

> A rising wave of light floods the pictures of children on concrete walls. The visitors of the memorial look at authentic pre-war pictures and meet the glances of children, whose names and exact places of death were recorded, and children whose names and fates remain unknown to us.[68]

The Vilnius monument not only speaks through images brought out of nothingness by means of light: music also plays an important role, and can be heard from the very beginning of the visit. In a way, it leads the visitor to the central point of the exhibition. It takes the form of a lullaby sung by a child, "Shtiler, Shtiler..." ("Quiet, Quiet"), with words written during the war in the Vilnius ghetto by Shmerke Kaczerginski, an educator, writer, poet and partisan. The music was composed by Alik Wołkowyski, an eleven-year-old prisoner of the Vilnius Ghetto at the time who, after the war, became the pianist known as Aleksander Tamir. The piece was first performed in front of a large theatre audience in April 1943, one of the last concerts organised by the Jewish Council (Judenrat) before the liquidation of the closed Jewish quarter.[69] Later, the lullaby gained popularity among Holocaust survivors and became one of the most frequently performed songs on anniversary ceremonies dedicated to the victims of Nazi crimes. This historical context is all relevant to understanding the role of the lullaby in the Vilnius museum space. It not only tells the story of the tragic Jewish fate, it is also a kind of witness and "participant" in that fate. As well as providing an aesthetic experience, it becomes an important testimony that co-creates the message of both the monument and the exhibition as a whole. The circumstances of the lullaby's creation, like the first performances of the piece, take us directly back to the time of the Second World War and provoke reflection on the living conditions in the Vilnius Ghetto, the fate of the community living there and the tragedy of the Holocaust. Sound thus becomes an essential tool for building the narrative thread of the

[68] *Rescued Lithuanian Jewish Child Tells about the Shoah*, accessed 18 May 2023, https://www.jmuseum.lt/en/expositions/i/195/.

[69] Decades later, this performance was recounted by the woman who witnessed it – Nehamka Rahav (then Shuster), who was 16 years old at the time. She was the same age as the girl she remembered – Mirele – who sang a lullaby composed by Wołkowyski: "Mirele, a tiny little girl, goes up to the stage. And when she starts singing – her voice sounds like bells – everybody begins to cry. Not hysterically, not wailing – their sobbing was terrible but silent, out of the depths. It was perhaps the first time people there had let themselves express what they had been feeling for a year and a half. I didn't cry when they took my father away and murdered him in Ponar. I didn't cry, not once. But that day I cried too, and my tears kept falling, and Mirele stood there, singing – that's something I've never wanted to forget." TE'ENI, Aviad. *The Remarkable Story of 'Shtiler, Shtiler'*, accessed 19 May 2023, https://www.tabletmag.com/sections/history/articles/a-song-of-the-vilna-ghetto.

place. It affects the listener both through its melancholic melody and the words that are sung. However, its history is also significant.[70]

"Shtiler, Shtiler..." is the story of a mother singing a lullaby to her child – although it is in fact a lullaby sung to those who rest in their graves:

> Quiet, quiet, let's be silent,
> Dead are growing here.
> They were planted by the tyrant,
> See their bloom appear.
> All the roads lead to Ponar now,
> There are no roads back,
> And our father too has vanished,
> And with him our luck.[71]

The song recounts the dramatic events that occurred in Ponary, where people crowded into the Jewish quarter of Vilnius were taken to the forest and shot. It refers to the collective experience of those who lost their parents, spouses, children or friends there. And while it describes dark events and mourns the pain and suffering of the ghetto prisoners, it also expresses the hope that light will prevail and overcome the darkness surrounding the Jews, bringing them the freedom they crave.

Created during the Holocaust, "Shtiler, Shtiler" was part of a rich tradition of Yiddish lullabies telling the story of a lost father. In these songs, the mother usually comforts her child and assures them that a better future awaits them. The lullaby becomes the backdrop for contemplating the fate of the child victims of the Holocaust immortalised in the photographs on the walls of the memorial. It fills the entire space of the exhibition, along with the with videos, photographs, documents and the memories of witnesses who talk about losing their loved ones, the fear of persecuted children, and also about survival. The song becomes the voice of both those who survived the Holocaust and those whose lives were ended prematurely due to the brutal crimes committed by the Nazis.[72]

Shalechet (Fallen Leaves), Berlin, Germany

We can also see the important role of sound in the installation titled Shalechet (Fallen Leaves), presented at the Jewish Museum Berlin (Fig. 3), prepared by Israeli sculptor Menashe Kadishman, dedicated to the victims of the Holocaust and all victims of violence. He used over 10,000 metal discs to create his project, cutting holes in each of them to give them the appearance of a human face with wide eyes and a screaming mouth. These faces appear to be contorted in pain and frozen in fear.[73] The discs, as their name suggests, are like fallen leaves, symbolising the death of innocent victims of war crimes and evoking painful memories. The

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[70] *Shtiler, Shtiler (Quiet, Quiet),* accessed 18 May 2023, https://www.yadvashem.org/yv/en/exhibitions/music/shtiler-shtiler.asp; *Shtiler, Shtiler*, accessed 19 May 2023, https://holocaustmusic.ort.org/places/ghettos/vilna/shtiler-shtiler/.

[71] *Shtiler, Shtiler (Quiet, Quiet)*….

[72] Ibidem.

[73] SODARO, Amy. Memory, History, and Nostalgia in Berlin's Jewish Museum. In: *International Journal of Politics, Culture, and Society*, 1(26), 2013, p. 85.

discs are placed on the floor of one of the museum's corridors.[74] Visitors usually go there after seeing the part of the exhibition devoted to the memory of the Holocaust, located in the basement. To fully experience Kadishman's installation and see its full extent, the visitor must walk over the disks – as if over the fallen leaves – causing the individual elements to move and bump against each other. At this moment the sonic aspect of this project is revealed, because each step triggers a metallic noise which resembles the sound of a chain. This sound is enhanced by the acoustics of the concrete tunnel which houses the installation – a high, empty and ascetic space.[75] The sound, like a scream or moan, carried by the echo may intensify the feeling of discomfort or guilt caused by the (symbolic) awareness of walking on people's heads or trampling on human faces. Such an experience may bring up associations with a visit to Auschwitz–Birkenau, where every day thousands of people move around the space where the ashes of the victims of the Holocaust are buried.[76] Another association mentioned by the installation's author refers to the metallic sound produced when a train runs on its tracks. In this case, the sound resonating in the museum space recalls the railway transport of prisoners to concentration or extermination camps. At the same time, Kadishman notes that this is only one of many possible interpretations, and that he does not attribute only one meaning to his work. He leaves its interpretation to the audience, allowing them to constantly look for new meanings and dimensions.[77] It may, for example, be associated with the sounds of forced labour during the war. Regardless of which interpretation we adopt, we must admit that the moving sound emitted while visiting the Shalechet installation undoubtedly provokes powerful thoughts, emotions and feelings.[78] What is important is that the production of sound is not the result of direct action by the installation's author; rather, the audio layer of the project is triggered by the audience themselves. Without their involvement, it cannot be released. Thus, the audience of the installation become its co-creators. They have an important role to play, not only through experiencing the space prepared for them but also by actively participating in the experience.

Sound in Seodaemun Prison in Seoul, South Korea

Constructed in 1907–1908, two years before the Korean Peninsula was incorporated into Japanese territory, Seodaemun Prison Museum is the site that recalls the colonial aspects of Japanese–Korean relations. Although the Japanese occupation of Korea ended with Japan's capitulation in 1945, the prison was used until 1987 – the moment when South Korea became a democracy. It operated under various names: Seodaemun Prison, Seodaemun Jail, Seoul Prison and Seoul Detention Centre. Although it operated for 38 years under Japanese administration and 42 years under Korean, the contemporary shape of this place, which serves as a site of memory, consists mainly of preserved buildings erected in the 1920s.[79] The appearance of these buildings from the Japanese colonial period strengthens the feeling of "shame, violence,

[74] *Jüdisches* Museum Berlin. *English*. Berlin: Stiftung Jüdisches Museum Berlin, 2020, p. 20.
[75] JAWOREK, Jarosław. Pomniki dźwiękowe. In: *Pomniki w epoce antropocenu*, ed. Małgorzata Praczyk, Poznań: Wydawnictwo Naukowe UAM, 2017, p. 195.
[76] DOLEGŁO, Sławomir. *Nie tak dawno, nie tak daleko. Strategie komunikacyjne miejsc pamięci Holocaustu*. Kraków: Instytut Dziennikarstwa, Mediów i Komunikacji Społecznej UJ, 2019, p. 204.
[77] JAWOREK, Pomniki dźwiękowe…, p. 195.
[78] SOUTO, Ana. Experiencing memory museums in Berlin. The Otto Weidt Workshop for the Blind Museum and the Jewish Museum Berlin. In: *Museum & Society*, 16(1), 2018, pp. 18–21.
[79] LEE, Seung-yun, *Hall of Memories. Old Seodaemun Prison Transformed from Instrument of Oppression to Place of Learning*, accessed 2 January 2024, https://www.kocis.go.kr/eng/webzine/202204/sub01.html.

and trauma left by the Japanese empire"[80]. It is this feeling and history that are at the core of an application by the site's management board to seek nomination for UNESCO World Heritage status.[81] Despite the long period of activity (the prison operated for longer in the post-war period than under Japanese occupation), it is claimed that if visitors do not take in information about its activity they might be left with the impression that the prison was closed after America liberated Korea following Japan's surrender.[82]

In Seodaemun Prison Museum, our analysis of sound (and its controversies) focused on the Japanese occupation period. The most important place with regard to of sound is the Basement Torture Chamber, which shows how visitors' emotions can be shaped into forming negative attitude towards the Japanese.[83] In this place, one of the individuals commemorated is Yu Gwan-sun, a young participant in the March First Movement (1919). Yu Gwan-sun was imprisoned and, following her trial, was transferred to Seodaemun Prison, having been sentenced to additional seven years of imprisonment. She continued to organise calls for independence from within jail.[84] She died in 1920 after being tortured. In the Torture Chamber, however, there is no information about the torture suffered by democracy activists in the 1960s and 1970s.[85] The place makes a very frightening impression, causing visitors pass through quickly due to the combination of the sound of screams, overwhelming cold and darkness.[86] However, a quick walk through the space, especially for those who find it too stressful to stay there, allows only a cursory impression of the perpetrators and the victims. Commands barked out in Japanese are played over the loudspeakers, their shouts reminding visitors of the torture carried out here by representatives of that nation, depicted physically by large mannequins in Japanese colonial uniforms. The room also contains smaller mannequins depicting Korean girls. The overwhelming sound of the space, its gloomy nature and the limited opportunities to learn about the broader history of the building mean that the difficult heritage represented by the building is reduced to the Japanese occupation and ignores the struggle for democracy in South Korea up to 1987. The use of Japanese voices in the exhibition also bends history, given that even during the Japanese occupation many of the guards who used torture were Korean, and they remained in senior positions under the post-war prison administration.[87] This specific case therefore allows us to look critically at the use of audioscapes in memorials, especially in the context of commemorating traumatic experiences. As Hjortkjær states,

> Sound is a powerful medium and enables museums to amplify the sensory experience – yet there is also a risk that sounds may take over and disrupt the experience of museum visitors. Therefore, it is important that museums carefully consider the use of sound in their exhibitions.[88]

[80] HUANG; LEE, Difficult heritage diplomacy…, p. 144.
[81] Ibidem.
[82] DUDDEN, Alexis. *Troubled Apologies among Japan, Korea, and the United States*. New York: Columbia University Press, 2008, p. 9.
[83] OH, Minju. "Registers of Empathy" of Visitors towards the "Painful History" of South Korea within South Korean National Museums. PhD Thesis, School of Museum Studies, University of Leicester 2022, p. 98–99.
[84] PODOLER, Guy. Revisiting the March First Movement: On the commemorative landscape and the nexus between history and memory. In: *The Review of Korean Studies*, 8(3), 2005, p. 145.
[85] DUDDEN, *Troubled Apologies*…, p. 10.
[86] OH, "Registers of Empathy"…, p. 123.
[87] DUDDEN, *Troubled Apologies*…, p. 9.
[88] HJORTKJÆR, The Sound of the Past…, p. 454.

In the Basement Torture Chamber, the specific atmosphere and the lack of verifiable facts can serve as a tool to perpetuate visitors' belief that there was only one villain who oppressed the Korean people and ignores the Korean administration's responsibility for crimes committed against the opposition. The sound captures visitors' attention, "creates an atmosphere and conveys information that may not have been communicable via text or objects".[89] Sound is therefore not just a background, a supplement, an add-on. It sometimes plays a primary role, replacing another type of message when that proves impossible. Sound fills a gap in the creation of a message.

Silence over Pearl Harbor: USS Arizona Memorial, Honolulu, Hawaii

Although silence is the most important aspect of the Arizona Memorial in Pearl Harbor, Hawaii, US, it was music that supported the creation of this memorial and focused public attention on it. In early 1961, a charity concert was announced by Elvis Presley, who was himself a war veteran, to raise funds for the construction of the Arizona Memorial. The event was a huge success, raising a total of $64,000.[90] The decision to create the Arizona Memorial was made by President Eisenhower in US Public Law 85-344 in 1958 and fundraising was carried out throughout the United States, with donations from the state, private organisations and ordinary citizens.[91] The memorial eventually opened in 1962.

The Arizona Memorial is a white construction located above the USS Arizona, which was sunk by the Japanese. Visitors first enter the building to a film showing the American perspective of World War II, and then travel by boat to the platform, which is a memorial site. As the boat sails, information about elements of the surrounding landscape is presented, referring both to current edifices, such as the naval base, and historical ones such as the USS Missouri, on which the surrender of Japan took place. When arriving at the memorial, visitors are advised to remain quiet and solemn. The only sound that occasionally breaks through the silence is the "tears of the Arizona", which is actually the sound of oil coming out of the wreck.

The Arizona is also an "immaterial" monument, in the terms Salvatori uses to describe sites of remembrance, as well as one that has been designed to be "listened to".[92] Similarly to the Brühlsche Terrasse in Dresden, analysed by Salvatori,[93] the platform constructed over the USS Arizona's wreck overlooks the waters that enter the harbour from Mamala Bay, offering a place of silence in contrast to the nearby Pearl Harbor Naval Shipyard. Leaning against the railing of the platform, one can hear the oil coming out of the wreck of the USS Arizona – which is also the tomb of the soldiers who rest there. The oil, still present in the tanks, becomes "tears", a sound across which the fallen soldiers remind us of themselves. The role of the sound made by oil is to intensify visitors' sense of immersion and create an atmosphere unique to this place.[94] Therefore, the intention of the installation's may have been to immerse visitors in stories that

[89] Ibidem, p. 453.
[90] BREMER, Shannon Lee. *From Ship to Sarcophagus: The USS Arizona as a Navy War Memorial and Active Burial Ground/ "A Date Which Will Live in Infamy": Community Engagement at Pearl Harbor National Memorial and Museum*. 2021. PhD Thesis. The College of William and Mary, p. 14.
[91] BARBASIEWICZ, Olga. *Pomniki i miejsca pamięci w relacjach międzynarodowych. Wpływ pamięci na stosunki japońsko-amerykańskie z perspektywy Japonii*. Warszawa: IKŚiO PAN, 2016, p. 115.
[92] SALVATORI, Gaia. Stone or sound. Memory and monuments in contemporary public art. In: *IL CAPITALE CULTURALE. Studies on the Value of Cultural Heritage*, 12, 2015, p. 940.
[93] Ibidem.
[94] HJORTKJÆR, The Sound of the past..., p. 456.

can be felt emotionally and physically. This impact on all the senses is intended to intensify the desire to discover stories.

Hiroshima Peace Memorial Museum: a memorial which depicts the tragedy that does not need sound

In March 1949, the Japanese Parliament, after lengthy negotiations with the American authorities regarding the censorship previously imposed on discussion of America's nuclear bomb attack on Japanese cities, enacted a law allowing Hiroshima to be rebuilt as a city of remembrance and peace.[95] The city now contributes to remembering the events of the first half of the twentieth century from the perspective of being a victim (in Japanese, *higaisha ishiki*) potentially displacing within Japanese society the awareness of being a perpetrator of the events preceding Hiroshima, characterised in this article through memorials in South Korea and the United States. Hiroshima Peace Memorial Museum[96] is the main object in which this history is presented, located within a park that is also part of the memorial. It is the main location in Japan where this tragedy of World War II is commemorated from the Japanese perspective, and the stage for many political events, including international ones.[97]

The exhibition itself does not utilise any sound. However, the Peace Bell, located in the park, does provide a sound-based experience. It can be struck while strolling through the park, so every now and then the muffled sound of a bell ringing can be heard in the area. Build in 1964, the Peace Bell is a symbol of the anti-war movement and opposition to nuclear weapons. Carved by Masahiko Katori, it features engravings symbolising world unity and the desire to destroy nuclear weapons.[98] The bell is surrounded by a pond with lotus flowers. In addition to its daily use by visitors to the park, the bell is used for significant occasions. One such occasion is the Peace Memorial Ceremony, held annually by the Hiroshima City authorities to commemorate the tragedy of an atomic bomb being dropped on the city and to express the desire for peace for all time. On the agenda for this event, the eerie sound of a bell echoes for a minute after the laying of flowers at the cenotaph in memory of the victims and is accompanied by the silent prayers of the participants.[99]

In 1996, the Environment Agency (nowadays the Ministry of the Environment) decided to establish a "Soundscapes" project, collecting "soundscapes that people in various parts of the country cherish as local symbols and wish to preserve in the future".[100] One-hundred diverse soundscapes were selected, accommodating both the natural environment and those generated by human culture and local industry. The Bell of Peace is among them.

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[95] BARBASIEWICZ, *Pomniki i miejsca pamięci*…, p. 115.

[96] In the Japanese language version it is called the *shiryōkan*, meaning not only museum, but also archive, documentation centre.

[97] In May 2023, Hiroshima was the site of the G7 summit and the spouses of the heads of government visited the Hiroshima Peace Memorial Museum and laid flowers at the Cenotaph of the Atomic Bomb Victims. In 2016, G7 representatives met in Ise-Shima discussing global economic and political challenges. A key moment of the meeting of this group was the visit of heads of state to Hiroshima and paying tribute to the victims of the atomic attack.

[98] "Peace Bell: Spot", HIROSHIMA PEACE TOURISM, accessed 5 January 2024, https://peace-tourism.com/en/spot/entry-78.html.

[99] "Peace Memorial Ceremony", The City of Hiroshima, accessed 5 January 2024, https://www.city.hiroshima.lg.jp/site/english/115509.html.

[100] "残したい日本の音風景１００選 [100 Sounds That We Want to Leave in Japan]." The Ministry of Environment, accessed 5 January 2024. https://www.env.go.jp/air/life/nihon_no_oto/.

Conclusions

Memorials and museums play a crucial role in preserving the history and culture of a nation. They offer the opportunity to reflect on the past and understand the events that have shaped us as a society. Regardless of the continent, memorial spaces – whether in the form of monuments, memorials or museums – are transformed, not just to persuade visitors to visit a particular place for its attractiveness, but above all to convey meaning, to reflect or evoke the emotions that the originators of a given space want to implicate in their audiences. It is important to treat heritage with respect and use it to achieve positive goals, such as promoting peace and understanding between nations. In this paper, various use of sound in memorials were analysed, with a particular focus on opposites, including silence.

This article addressed issues around expressing difficult heritage in the form of memorials and monuments, as well as in the museum space. The interdisciplinarity of sound was shown, especially with regard to the presentation of difficult heritage – in this case related to the painful experiences of individual nations in the first half of the twentieth century. There are many memorials to the victims of the Holocaust in Europe, accompanied by living-memory accounts of the crimes of genocide committed by Nazi Germany. These memorials will endure for generations both inside and outside Europe. In the Asia–Pacific region, memory of this period in history is often linked to the politics and activities of Japan. When analysing the first half of the twentieth century, especially Japanese politics, these images focus on Japan's expansion on the Korean Peninsula, the incorporation of Korea into Japanese territory, other wars on the Asian continent in the 1930s, and the attack on the US military base at Pearl Harbor in December 1941.

The Children's Memorial at Yad Vashem in Jerusalem uses sound to remember the fate of the youngest victims of the Holocaust. The site connects to reality and interacts with visitors' senses, enhancing the emotional experience. The darkness of the memorial intensifies the perception of sounds. Sound is a key element of the interactive memorial at the Museum of Tolerance, presenting an exhibition about child victims of the Holocaust in Lithuania. The lullaby "Shtiler, Shtiler…" plays an important role, guiding us through the exhibition. Israeli sculptor Menashe Kadishman created the installation Shalechet (Fallen Leaves) at the Jewish Museum in Berlin using more than ten thousand metal discs that resemble fallen leaves. Those passing through the installation produce a chain-like sound, adding a sonic layer to the experience of the Holocaust.

In Asia, the Seodaemun Prison Museum in Seoul recalls Korea's colonial history under the Japanese administration and is applying for UNESCO heritage status, but the exhibition focuses mainly on the Japanese-administered era of the prison and ignores its connection to the struggle for democracy in South Korea. Content that is meant to evoke emotions without verification of facts is conveyed through sounds that can frighten viewers in the museum space.

After the Pacific War, two significant places of remembrance were created. The Arizona Memorial in Pearl Harbor is a place of silence, where visitors are encouraged to reflect on the tragedy and sacrifice of the USS Arizona. The sound of oil seeping from the wreck serves as a reminder of fallen soldiers. In Japan the reconstruction of Hiroshima as a city of remembrance and peace made the Peace Memorial Museum and the Peace Bell important symbols against war and nuclear weapons. The silence of this museum and the solemn sound of the aforementioned bell are symbols not only of the nuclear tragedy, but above all of the quest for peace.

The sites depicted show how silence, pierced by sound, can contribute to commemoration, a call for peace and the non-repetition of history's mistakes, but can also be used to misrepresent the past. Nevertheless, the sounds portrayed through particular places in the story have a deep meaning and move the audience, enshrining themselves in their memory.

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Appendix 1

Fig. 1: *Children's Memorial – Yad Vashem*. Photo by Marcin Zaborski.

Fig. 2: *Children's Memorial at the Jewish Museum in Vilnius.* Photo by Marcin Zaborski.

Fig. 3: *Shalechet (Fallen Leaves) – Jewish Museum Berlin*. Photo by Marcin Zaborski.

The Art of Chinoiserie of the Seventeenth to Nineteenth Centuries in Museum Complexes of Ukraine

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The Art of Chinoiserie of the Seventeenth to Nineteenth Centuries in Museum Complexes of Ukraine
This article discusses the features of manifestations of the Chinoiserie style in Ukraine. The study focuses on architectural and artistic monuments of the seventeenth to nineteenth centuries, with an emphasis on interior design and garden art. The article outlines the routes of penetration of Chinese handicrafts and objects of the European Chinoiserie style and identifies the leading motifs and elements that were used in organising the subject-spatial environment of Ukrainian estates: mural painting, porcelain, furniture, park sculpture and small-scale architecture. With reference to a generalisation of the authors' field investigation results, the article outlines features of the use of elements of Chinoiserie style and their adaptation to local landscapes and cultural contexts. The main observations and conclusions of the study were obtained using methods of figurative–stylistic, formal, semantic and comparative analyses.

Keywords: Chinoiserie style, architectural and arts ensembles of Ukraine, interior design, garden art, porcelain manufacture in Ukraine

Introduction

The term "chinoiserie" (Chinese-style, from the French Chinois, i.e. Chinese) was first recorded in 1836 in the novel *L'Interdiction* by Honore de Balzac, as the name given to things made in the Chinese style. However, the phenomenon of chinoiserie itself arose at the end of the sixteenth century and acquired development and stylistic maturity in the second half of the seventeenth and eighteenth centuries. Chinoiserie developed against the background of a fascination with the mysterious land of China and the exotic East more generally. Therefore, often within chinoiserie one can see Japanese, Indian, and Arabic motifs and pictorial elements

next to Chinese ones. The initial fascination with the fabulous East eventually led to the development of a European stylistic trend that interpreted Chinese and other forms and motifs of Eastern cultures within the framework of its own artistic system. Its development was supported by active trade relations with the countries of the East, as a result of which European markets were saturated with art objects that carried new plots, ornaments, and forms. Chinoiserie became a transnational style and was reflected in architecture, landscape gardening, arts and crafts, painting and costume.

The manifestations of the pan-European artistic phenomenon known as chinoiserie in the lands of Ukraine indicate, first of all, the broad connections of these lands with both eastern and western states. It was European connections that led to the appearance of the first manifestations of chinoiserie in the castles and estates of Polish rulers in the lands of modern Ukraine. Furthermore, due to historical circumstances, European influences also penetrated through the Russian Empire. Therefore, Ukraine has its own history of chinoiserie, which is still only partially explored.

Unfortunately, the dizzying stream of events of Ukrainian history destroyed a significant part of the monuments in the style under study, and the course of modern events threatens the existence of those preserved or restored through the efforts of enthusiastic researchers and restorers. Meanwhile, understanding the Ukrainian part of the pan-European artistic process will make it possible to form a more adequate understanding of its scale and specific manifestations. Thus, the purpose of this article is to highlight the features of manifestations of the Chinoiserie style using the example of architectural and artistic ensembles of the late seventeenth to nineteenth centuries on the lands of modern Ukraine, and to determine the state of their preservation.

Historiography of the issue, materials and research methods

Manifestations of the Chinoiserie style in Ukrainian art is a topic that has found only partial coverage in professional reading. Usually these are works devoted to general issues of Ukrainian Orientalism which, among other directions inspired by the passion for the art of different countries of the East, also contain individual observations on the reception of Chinese art. Among them are studies by I. Teslenko[1] and A. Ozhoha-Maslovska[2]. The focus of these two researchers is mainly on painting and graphics by Ukrainian masters of the first third of the twentieth century and the beginning of the twenty-first century, respectively.

The problematic of chinoiserie in the art of Ukraine in the late nineteenth to early twentieth century was raised by Tang Qianrui.[3] In the key points of her report, the author refers to works stored in the collection of Kharkiv Art Museum.

Valuable data and opinions regarding Chinese porcelain and the development of domestic production with the inevitable penetration of relevant motifs are set out in the works of

[1] TESLENKO, Iryna. "Orientalism in Ukrainian art of the first third of the twentieth century", Thesis abstract for Cand.Sci. 17.00.05 (Fine art), Kharkiv State Academy of Design and Arts.

[2] MASLOVSKA, Alla. Orientalism in the modern art of Ukraine. In: *Humanities and Social Sciences Review*, 03(03), 2014, pp. 439–444.

[3] TANG, Qiangrui. «Umovnyi» Kytai v ukrainskomu «shynuazri» kintsia XIX – pochatku XX stolittia. In: *Pytannia skhodoznavstva v Ukraini*. Kharkiv: H.S. Skovoroda Kharkiv National Pedagogical University, 2018. Pp. 130–133.

Ukrainian researchers such as L. Bekh,[4] T. Lytovko,[5] T. Nechyporenko[6] and O. Shkolna[7]. The transformations of Chinese patterns in traditional Ukrainian embroidery analysed by N. Otrokh[8] make it possible to understand the penetration of certain Chinese pictorial motifs and their role in the development of works in the Chinoiserie style[9].

Research published by B. Omelchuk,[10] I. Pohranychna[11] and V. Smolynets[12] devoted to architectural ensembles, among which there are examples of chinoiserie, are of great importance in the context of the chosen topic. We note separately the collective investigation devoted to analysing the influence of Chinese-style garden layout on corresponding architectural forms in Europe[13]. Among the famous European ensembles, the authors pay attention to two outstanding park ensembles in Ukraine (Oleksandria and Sofiivka). In the next publication by these authors, the "Chinese pavilions" of Oleksandriia and Sofiivka are also mentioned as a part of a broader study devoted to European chinoiserie with a focus on the stylistic features of the pavilions.[14]

All the mentioned studies, to one degree or another, have contributed to the formation of a motley picture of chinoiserie in Ukrainian lands from geographical and historical perspectives.

The range of materials studied includes samples of chinoiserie pieces from museum collections in Ukraine, as well as watercolours and photographs documenting the appearance of monuments in the nineteenth, twentieth and early twenty-first centuries. Among them there are works by famous Austrian watercolourist Willibald Richter.[15]

The chosen research methods were determined by the specific features of the material. In particular, in this work we used methods and techniques of formal, figurative–stylistic, semantic and comparative analysis. In addition, field research methods included photographic recording and interviews.

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[8] OTROKH, Nataliia. Ornamentalni motyvy kytaiskoho shovku i yoho vplyv na transformatsiiu yevropeiskykh vizerunkiv. In: *Pytannia kulturolohii*, Vyp. 31, 2015, pp. 166–174.

[9] chinoiserie = China style.

[10] OMELCHUK, Bohdan & TOMIUK, Ihor. Palatsovyi chinoiserie Zolochivskoho zamku : z mynuloho do suchasnykh kryteriiv rozvytku. In: *Naukovi zapysky Lvivskoho universytetu biznesu ta prava.* Vyp. 14, 2016, pp. 112–116

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[12] SMOLYNETS, Volodymyr. Geneza palatsu u strukturi sela Pidhirtsi. In: *Visnyk Lvivskoho natsionalnoho ahrarnoho universytetu. Seriia : Arkhitektura i silskohospodarske budivnytstvo.* № 17, 2016, pp. 147–151.

[13] ŻYCHOWSKA, Maria; IVASHKO, Yulia; CHANG, Peng; DMYTRENKO, Andrii; KULICHENKO, Nataliia; & ZHANG, Xin Mu, The influence of traditional Chinese landscape architecture on the image of small architectural forms in Europe. In: *Landscape Architecture and Art*, 18(18), 2021, pp. 59–68.

[14] IVASHKO, Yulia; CHANG, Peng; DMYTRENKO, Andrii; KOBYLARCZYK Justyna; KRUPA Michal. Specifics of stylised shapes of Chinoiserie-style pavilions as the basis of their restoration. In: *Muzeológia a kultúrne dedičstvo*, vol. 12, 2024, issue: 2, pp. 27–41 doi: 10.46284/mkd.2024.12.2.2

[15] Richter, Willibald (Dresden, 1805–1880, Vienna) – Austrian artist, watercolourist.

The origins of chinoiserie in the lands of modern Ukraine

Relations between the Ukrainian lands and the Far Eastern countries have existed for a long time through the countries of the Middle East, primarily Persia and the Ottoman Empire, as well as the Crimean Khanate. In fact, parts of the so-called "Silk Road" ran through these lands at different times. As it is known, this name itself appeared only in the nineteenth century, as a certain unifying image for trade routes that went from the Far East to the countries of the Mediterranean basin and the Black Sea region.

In Ukrainian folk songs of the Cossack period (seventeenth – eighteenth centuries), *kytaika* (nankeen cloth) is mentioned. This was the name given to Chinese-made silk fabric, predominantly blue and then red, that found its way to Ukrainian lands. Due to its scarcity and, accordingly, high cost, *kytaika* acquired the status of something unusual and special in the mass consciousness. In part, Chinese silk had a ritual significance: famous heroes and Cossack leaders were covered with a piece of *kytaika* at their funerals, as was sung in an ancient Cossack funeral song:

Лежить козак на купині,	*The Cossack lies on a hummock,*
Китайкою лице вкрили.	*His face was covered up with a piece of nankeen cloth.*

A well-known researcher of Ukrainian embroidery and traditional clothing, Natalia Otrokh, notes that Chinese silk fabrics, mainly "gilded" (with metal thread), could be found in Ukrainian lands in the second half of the seventeenth and eighteenth centuries. In China, such technology has been known since the Han era (third century BCE to the third century CE). It is possible that the art of silk sewing spread from China through Persia; certainly it became quite popular in Ukraine. Of course, the high price of silk led to the circulation of embroidered silk items among wealthy Ukrainians. But there was variety in the use of such sewing, which is found not only as an element of clothing or religious church items but also in interior design, and even in expensive horse tack.[16]

Natalia Otrokh points out the "universality" of some elements of Chinese embroidery ornamentation, in particular mentioning tulip-shaped flowers and butterflies. For example, the butterfly, which resembles the Chinese character for "80", was a symbol of longevity, and was also used as a symbol of the tenderness and vulnerability of existence. "In Ukraine, [the butterfly] symbol did not spread much and was found mainly on imported Chinese fabrics. In particular, Ukrainian ethnographer and art historian N. Novytska in her notes mentions a sample of Chinese fabric with butterflies dating from 1777". [17]

Otrokh's statement that Chinese motifs could acquire a different character over time, become stylised, and change in accordance with the understanding and tastes of the population of a particular territory[18] is important for our research. The transformation of Chinese motifs that occurred during the process of adaptation in Europe (and, accordingly, in Ukraine) and the inclusion of these motifs in national ornamentation, albeit with the loss of their original meanings, is reminiscent of the processes that will later be identified in the art of "chinoiserie".

[16] OTROKH, Ornamentalni motyvy …, p. 171
[17] Ibidem, p. 169
[18] Ibidem, p. 172

Goods of oriental origin that the Cossack Ukrainian elite paid attention to included beverages such as tea and coffee. It is known that Hetman[19] Bohdan Khmelnytskyi liked to start the morning with a cup of coffee, which he appreciated in his youth, when he was in Turkish captivity. Along with these beverages, the corresponding utensils also arrived in Ukraine. Researcher Liudmyla Bekh highlights this when citing documentation describing the life of the Ukrainian elite of the eighteenth century. General Flag-Bearer[20] Mykola Khanenko, ancestor of the outstanding philanthropist and collector Bohdan Khanenko, was very fond of porcelain. His diary repeatedly mentions the sets of china he purchased. Among the property of the Prior of the Holy Trinity Monastery in Wilno (now Vilnius, Lithuania), a Chinese porcelain teapot is indicated, and the description of the property of the Archimandrite of Saint Cyril Monastery, Kyiv, includes three pairs of Chinese porcelain tea cups.[21]

As is known, in Europe, the French monarch Louis XIV became a trendsetter for Chinese products. In his favourite "brainchild", the royal apartments at the Palace of Versailles were decorated with Chinese fabrics and porcelain. The Trianon de Porcelaine in Versailles – a building with five pavilions decorated with white and blue tiles – gave rise to the spread of a fashion for "Chinese" palaces, parlours and pavilions. This fashion gained popularity in Europe in the second half of the seventeenth century. Since then, various works of art containing references to Chinese art have been called "chinoiserie". The demand for "Chinese style" spread so far that European porcelain production began to produce local products similar to Chinese ones.

Similar processes did not spare Ukraine. Representatives of the wealthy elite paid tribute to the fashionable European chinoiserie trend as they built their residences. They purchased European products in this style, invited craftsmen from various European countries to undertake Chinese-inspired designs and subsequently founded local production of fashion products. So, let us look at Chinoiserie monuments on the lands of Ukraine.

Chinoiserie in architectural and arts complexes and porcelain of Ukraine of the seventeenth to nineteenth centuries

One of the early examples of chinoiserie in the lands of Ukraine that should be considered is Pidhirtsi Castle.[22] French military engineer Guillaume Levasseur de Beauplan (1595–1685) and Italian architect Andrea Dell'Acqua (1584–1656) are among its possible designers. The erection of the castle began in the 1630s by order of the Polish-Lithuanian Commonwealth's Grand Crown Hetman Stanisław Koniecpolski. Subsequently, the castle was seriously damaged during the Khmelnytskyi Uprising of 1648. It was rebuilt several times and it changed hands among representatives of various noble Polish families, such as Sobieski, Radziwill and Rzewuski. Over time, the castle lost any defensive function and acquired the features of a fashionable and comfortable secular residence for receiving and hosting guests (Fig. 1). It was in the eighteenth century, when the Rzewuski family became the owners of the castle, that baroque apartments

[19] Chief military leader of the Cossacks. Head of the Hetmanate, after 1648 (*henceforth as in* Gajecky, George (1975). Cossack Terminology: Suggestions for the Study of the Hetmanate, the Ukrainian Cossack State. Український історик (The Ukrainian Historian), 12 (45–46): 120–126.

[20] Ukr. *heneralnyi khorunzhyi*

[21] BEKH, Farfor u pobuti…

[22] Today, it is known as 'Pidhirtsi Castle' Preserved Grounds and Museum, located in the village of Pidhirtsi in Zolochyv district, Lviv Oblast, western Ukraine

appeared, among them the so-called Chinese Hall.[23] The last owners, the Sanguszko princes, carried out restoration work in an attempt to preserve the ensembles laid down by the previous owners.

Fig. 1: *Pidhirtsi Castle, current view.* Photo 2014: Wikipedia, https://surl.li/rolikt...

Archival photographs (Figs 2 and 3) display the interior of the Chinese Hall, the main decoration of which was wooden panels with Chinese motifs. Landscape compositions with pagodas and figures of people in exotic clothing are highlighted with rocaille frames and are visually combined with images of tree branches and birds. The Chinese style of the interior is complemented by a tall longcase clock and a writing bureau, both decorated with chinoiserie motifs using the lacquer painting technique, and two screens. Unfortunately, all this remains only in photographs: during the Soviet period, a hospital was set up in the castle premises and most of the items were transferred to Lviv National Gallery; the interior decoration and, in particular, the wooden panels with relief Chinoiserie scenes were lost during the fire of 1956. When Ukraine gained independence, the residence was transferred to the control of 'B.H. Voznytskyi' National Art Gallery (Lviv) with the aim of its restoration.

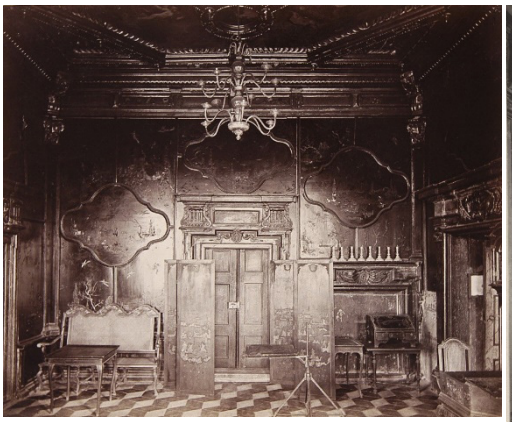

Fig. 2-3: *The Chinese Hall in Pidhirtsi Castle.* In: Pidhirtsi Castle 140 years ago: rare photos, https://surl.li/cxnzdf.

[23] BOZHKO, Nataliia & TSUBOV, Leonid. Vykorystannia pamiatnykiv arkhitektury radianskoiu vladoiu u 50–60-ti roky XX st. yak metod nyshchennia istorychnoi pamiati ukraintsiv. [The use of architectural monuments by the Soviet authorities in the 1950s and 1960s of the XX c. as a method of destroying the historical memory of Ukrainians]. In: Aktualni pytannia humanitarnykh nauk: mizhvuzivskyi zbirnyk naukovykh prats derzhavnoho pedahohichnoho universytetu imeni Ivana Franka, Vyp. 20, T. 1, pp.16–17.

While Pidhirtsi Castle only hosted a single hall that corresponded to the fashion for the "Chinese" style, Polish King Jan III Sobieski had an entire Chinese Palace[24] built at his residence in Zolochiv Castle. Definitive documentation regarding the beginning of construction of this palace have not yet been discovered, but experts date the building to the end of the seventeenth century. There is also no clear answer about the original purpose of the rotunda-like in plan Chinese palace. However, it is known that Jan III professed a love for French fashion and therefore the appearance of buildings and decorations in the Chinoiserie style in his possessions was not accidental (Fig. 4). Although the interiors of Zolochiv Castle have also not been preserved, judging by the presence of family coats of arms in the design of the entrance to the Chinese Palace, outside and directly in the apartments – as well as by analogy with descriptions of the residence of Jan Sobieski in Yavoriv – researchers suggest that the building was used for celebrations, including the reception of foreign ambassadors.[25] In this case, filling the Chinese Palace with exotic, expensive things from the East testified not only to the status of the owners, but also to their education and closeness to the famous royal families of Europe.

Fig. 4: *The Chinese Palace in Zolochiv Castle, current view.* Photo 2013: Wikipedia, https://surl.li/ulphyp.

The famous Ukrainian researcher O. Shkolna recalls that the Polish elite reacted quite quickly to French fashion and decorative porcelain. Therefore, in Ukrainian lands, which in the second half of the seventeenth century belonged to King Jan III Sobieski, the production of soft-paste porcelain and faience ware was established. Zhovkva-Glinsko porcelain dishes and tiles were made according to samples of European chinoiserie. Local Glinsko tiles in the Chinoiserie style were, by order of the Polish monarch, used to decorate the Chinese Pavilion at his residence in Zolochiv Castle. The interiors of the pavilion were decorated with real Chinese products as well as chinoiserie items.[26] Unfortunately, both the decoration and utensils of the palace disappeared completely – the establishment of a prison within the walls of the Chinese Palace by the Austrian government in 1872 made it impossible to preserve the interiors. However, the building itself and the remains of a regular park have still been preserved almost intact; in combination with the architectural style, they indicate the representation of Chinoiserie within the framework of the Rococo style. The transfer of the castle buildings to the control of the Lviv National Art Gallery and the establishment, in 2004, of the Museum of Oriental Art in the Chinese Palace with a collection of works of fine art from the countries of the East undoubtedly contributed to the preservation of this monument.

[24] The castle is situated in the town of Zolochiv, Lviv oblast, western Ukraine.
[25] OMELCHUK, Palats chinoiserie Zolochivskoho zamku…, p. 113.
[26] SHKOLNA**,** Dukhovno-estetychnyi spadok…, p.65.

In Chudnov and Korets, which were also the part of the Polish–Lithuanian Commonwealth at that time, porcelain production began in 1783 under the auspices of Czartoryski princes, taking European tableware as an example, including pieces in the Chinoiserie style. "In Korets this was noticeable from the shapes of the soup vases, which approximated the silhouettes of ancient Chinese motif pottery (for sacrifices)".[27]

Production also began in the Kyiv region in the famous Kyiv–Mezhyhirria faience manufactory, which opened at the end of the eighteenth century. From the 1830s dinnerware and household items in Chinoiserie style began to appear among the manufactory's diverse output. It should be noted that the "Chinese motifs" in the manufactory's products were mainly inspired by samples received in 1834 from St Petersburg, which in turn adapted English chinoiserie products. According to these samples, in 1835 the first pieces of the so-called "Chinese Series" were made, some of which are held by the National Museum of Folk Decorative Arts. In particular, "there are soup plates and dinner ones with a scalloped edge in two interpretations: an image of a Chinese man on a bridge and a figure of a Chinese man playing with a dog standing on its hind legs. The frame around the genre scenes is twigs with berries, flowers similar to the flowers of Chinese porcelain, leaves of various shapes" [28] (Fig. 5). Imitation Chinese motifs such as benches (Fig. 6), Chinese garden stools, flasks and caskets, and vases covered with "thick green or turquoise-blue, bluish-purple or milky-white glaze" also appeared. [29]

Fig. 5: *Service plate. Kyiv–Mezhyhirria manufacture, 1839*. Nat. Museum of the History of Ukraine

Fig. 6: *Garden stool. Kyiv–Mezhyhirria manufacture, 1830s*. Nat. Museum of the History of Ukraine

Among the Chinoiserie products of Mezhyhirria manufactory are tea sets depicting Chinese pavilions and gazebos surrounded by gardens (Figs 7–8), the echo of which can be felt in the landscape gardening art of Ukraine, which is discussed below.

It is also worth noting that production in Ukrainian lands arose at a time when European chinoiserie was increasingly moving away from primary Chinese motifs and plots, creating its own world of a slightly bizarre fantasy of China and, more broadly, the Far East, sometimes with humorous notes.

[27] Ibidem, p.66.
[28] NECHYPORENKO, Mezhyhirskyi faians..., p. 70.
[29] SHKOLNA, Dukhovno-estetychnyi spadok…, p. 66.

Fig. 7: *Service plate in the Chinese style. Kyiv–Mezhyhirria manufacture, first third of the nineteenth c.* Museum of the History of Kyiv

Fig. 8: *Tea-cup in the Chinese style. Kyiv–Mezhyhirria manufacture, 1846*. Nikanor Onatskyi' Regional Art Museum, Sumy

In this regard, the products of Volokytyne Porcelain Manufactory (Chernyhiv Governorate) owned by Andrii Myklashevskyi (1801–1895), a descendant of the famous Ukrainian noble Cossack family, are notable. To organise the work of the manufactory, officially founded in 1839, brothers François and August Darte – sons of the famous Parisian porcelain maker Louis Joseph Darte[30] who had previously worked at the famous Sèvres porcelain factory – were invited from France. The quality of its output is evidenced by the fact in the very the first year after opening the products of Myklashevskyi's manufactory were awarded a Large Silver Medal for "the art of the best porcelain things" at an exhibition in Moscow. Of course, the Chinoiserie-style products of Volokytyne complemented the porcelain palette of Ukrainian production.

The porcelain collection in Kharkiv Art Museum (*henceforth* KhAM) includes a small sculpture entitled "Chinese woman". Such "ethnographic" representations of peoples of the world were common in that era, when it was believed that works of art also had an educational function. In reliance specifically on the position of visual ethnography, the figurine seems to have carefully and in detail reproduced any of the actually existing Chinese female "types". However, these figurines also display numerous inaccuracies, including violations of etiquette in relation to Chinese people and their clothing, because in this case we are actually dealing with Europeans' fantasies about "exotic" China. Analysing a figurine from the KhAM collection, researcher Tang Qianrui cites a number of inconsistencies, in particular, a too open neck and low neckline, impossible in the conservative Chinese community of those times; the emphasis of a waistline by a belt that seems to slide down the hips, which also does not correspond to the real costume; and the too-curled toes of the shoes, which, it would seem, are the only ones that correspond to Chinese models. Even the facial expression of the "Chinese woman" is Europeanised, resulting in the effect of dressing up in Chinese clothes, a masquerade[31].

Another item in the Chinoiserie style from the KhAM collection recalls the famous production that appeared in the Left Bank Ukraine, in Slobozhanshchina: Budy Faience Factory.

[30] LYTOVKO, Tetiana. Volokytynska portseliana: ukrainska fabryka v XIX stolitti vrazyla svit skulpturamy vidomykh liudei (video). In: FREEDOM – Information Portal. https://uatv.ua/uk/volokytynska-portselyana-ukrayinska-fabryka-v-xix-stolitti-vrazyla-svit-skulpturamy-vidomyh-lyudej-video/

[31] TANG, «Umovnyi» Kytai…, p. 132.

This factory was established in 1887 and belonged to one of the most famous porcelain and faience manufacturers, Matvii S. Kuznetsov. Budy production was always directed towards mass production, as the antithesis of elite porcelain. The presence of Budy chinoiserie items once again indicates the popularity of this style even at the end of the nineteenth century. Analysis of the Chinoiserie plate, which is kept in KhAM, allows us to note another important special feature of late Chinoiserie. According to researcher Tang Qianrui, the plot of the painting on this plate, at first glance, is entirely Chinese. In the centre of it one can see man and woman figures worn in Manchu era clothing; there are also flowers, birds and butterflies similar to those often found in paintings with Chinese motifs. "However, the scene on the lower side of the plate, where a woman is depicted caring for a flower, by all indications is perceived as a Japanese motif".[32]

The combination of the Chinoiserie style with Japanisme – the combination of images from different cultures united by the big concept of "East" – indicates the high adaptability of the style. As Kharkiv researcher Tetiana Lytovko notes, "Chinoiserie retains primacy among eastern stylistic movements in terms of time of origin and duration, easily survives changes in styles and finds itself perfectly after the dominance of Baroque-Rococo in Classicism, Romanticism and Modernism".[33]

We find confirmation of this thesis in the estate ensembles of the corresponding period in both Right-Bank and Left-Bank Ukraine. Thus, the palace in Samchyky[34] is considered a typical example of Classicist architecture. Researchers distinguish three periods in the development of the ensemble. The first one began with the early buildings laid out for the residence of the Khaieckyi family in the eighteenth century. However, later changes were made, and the complex that has survived to this day was built at the beginning of the nineteenth century (architect Jakub Kubytskyi). Later, the new owners created a park area for the palace.[35] This park area is the location of the so-called Chinese house, which was erected to meet the need for an ice-house but at the same time, of course, suited the general appearance of the ensemble (Fig. 9). Its architecture is exclusively classicist in its with rustication, symmetry of windows, and design of the entrance portal. However, this exemplary classicism is crowned with a "Chinese roof" curved at the edges.

The assertion that the specified style combination was not accidental but met the interests and tastes of the owners is confirmed by existence of the Japanese Hall in palace's interior. Although in a damaged state, the original murals of the hall depicting Chinese and Japanese subjects have miraculously been preserved to this day.

The presence of figures of a samurai and a geisha-like figure among the paintings (Figs 10–11) testifies to the influence of Japonisme, which replaced the passion for Chinisme (Chinoiserie) at the end of the nineteenth century. In the Ukrainian version they were often combined, facilitated by the presence of Chinese elements in the system of symbols of Japanese art, which developed historically on the basis of Chinese art. Dragons, cranes, butterflies and bamboo – all of which we see in the paintings of the palace in Samchyky as leading motifs – were conceptualised and artistically interpreted within the framework of Chinese civilization and subsequently adopted by the Japanese. Above, we noted the fact that porcelain and faience (shapes and painting) made in Ukraine in the late Chinoiserie style also casually combine visual

[32] Ibidem.

[33] LYTOVKO, Skhid v kulturi Slobozhanshchyny…, p. 73.

[34] 'Samchyky' Palace is the series of palace and gardens located near the village of Samchyky, Khmelnytskyi region.

[35] POHRANYCHNA, Palatsovyi kompleks u s. Samchykakh…, p. 188.

Fig. 9: Jakub Kubytskyi. Chinese house. Manor in Samchyky. Early nineteenth c. Photograph from 2015.

Fig. 10: *Unknown author. Wall paintings of the Japanese hall. Manor in Samchyky. Nineteenth c. Current view*; photo by the author.

Fig. 11: *Unknown author. Wall paintings of the Japanese hall. Manor in Samchyky. Nineteenth c.* A Recent photograph.

Fig. 12: *Chinese export porcelain. Fragment of vase decoration: Phoenix, flowers and butterfly. Nineteenth c. Canton, China.*

elements of Chinese and Japanese cultures, even in fantasy European versions. The design of the Japanese Hall in Samchyky manor seems to offer a similar example.

Analysis of the visual motifs decorating the Japanese Hall allows us to distinguish three sets of paintings, of which two are Chinese and one is Japanese. The ceiling painting represents images typical of the "flowers and birds" genre developed in China (Fig. 13). A silhouetted branch with a bird sitting on it decorates the central part of the plafond. It is framed by dragons depicted on a golden background, as if borrowed from Chinese porcelain (Figs 14–15). This entire composition is surrounded by a typically Chinese ornamentation that emphasises the architectural and structural basis of the hall.

The second set of images uses the model of the Chinese still-life "flowers in a vase" motif (Figs 16–17). Despite the fact that this type of still life is also present in the European tradition, its version in Samchyky manor has distinctly Chinese connotations: the framing of bowls by a cartouche, reminiscent of the Chinese fan shape; the frontality of the composition and the empty space in which the bowl is placed; and the locality of colour of the bowl with emphasised contour. This type of still life was developed in China by the Italian Jesuit artist Giuseppe Castiglione, who, on the order of the Emperor, synthesised Chinese and European approaches to painting. In addition, the artist does not show a bouquet in a bowl but rather flowers growing in a pot, which has been a consistent motif of Chinese painting for several centuries, interpreted as a symbol of prosperity and well-being. The welcoming mood of the painting system is also supported by the compositions located in the upper register of the walls: images representing

Fig. 13: *Unknown author. Paintings in the Japanese Hall. Plafond. Manor in Samchyky. Nineteenth c.* Recent photograph. by the author.

Fig. **14:** *Unknown author. Paintings in the Japanese Hall. Plafond. Manor in Samchyky. Nineteenth c.* Recent photograph. by the author.

Fig. 15: *Chinese export porcelain. Vase decoration: red dragons. Canton, China. Nineteenth c.*

Fig. 16: *Unknown author. Wall paintings of the Japanese hall. Manor in Samchyky. Nineteenth c.* Recent photograph.

geisha and samurai are complemented by flowers, butterflies and phoenixes, also interpreted in the Chinese style. The visual source of these motifs was porcelain products, and they were an integral component of Chinoiserie-style interiors (Figs 11–12).

When characterising the artistic qualities of the paintings, we note that they differ in the level of execution. Today, it looks like only the plafond has its original appearance; it has not been restored, only covered with a thin layer of drying oil which, over time, has given a yellowish tint to the entire colour scheme. The mural painting was later fixed up and it seems this was done by local craftsmen. (Note the fact that the village of Samchyky was famous for its masters of home painting, which today is being revived by enthusiastic local artists.) At the same time, the compositional solutions of the wall paintings make it possible to trace the means of interpreting Chinese motifs on local soil. In this sense, the visual sources for ornaments, phoenixes and butterflies were clearly Chinese porcelain and its European analogues, which, as already noted, became firmly established in the everyday life of the Ukrainian elite from the seventeenth century. The development of local porcelain factories contributed to the spread of Chinese motifs, often in forms that had been adapted by Western European artists. Multiple repetitions of the "flowers in a vase" motif can be traced in a variety of high-value products

Fig. 17: *Unknown author. Wall paintings of the Japanese Hall. Manor in Samchyky. Nineteenth c.* Recent photograph.

Fig. 18: *Edward Blore (1787–1879). Chinese cabinet (small hall). Vorontsov's Palace, 1830–40. Alupka, Crimea.* Recent photograph.

and, at the same time, in local interior paintings. In Ukraine, flowers in a pot were interpreted as the Tree of Life and were used in murals, weaving, embroidery, and so on. Thus, Chinese motifs and especially the plant repertoire were easily adapted to the Ukrainian subject–spatial environment.

A Chinese cabinet is partially preserved in Vorontsov's Palace in Alupka.[36] (Fig. 18). Its interior was decorated with wooden panels with carved patterns and decorated with porcelain. In their upper register, the walls were decorated with bamboo mats with embroidered images of flowers in vases and large shells that echoed both Italian Renaissance decor and Chinese scrolls from the times of the Qing dynasty, a time when the floral still-life was in its heyday. Among the Chinoiserie-style utensils, a secretaire with lacquer painting has been preserved. Similar examples of Chinese-style furniture are kept today in the Museum of Ethnography, Arts and Crafts at The Ethnology Institute, National Academy of Sciences of Ukraine, in Lviv.

The high adaptability of chinoiserie can also be seen in the art of gardening. In the nineteenth century, parks became an integral part of the manor estate. More than 2000 years of Chinese gardening experience could not go unnoticed by Jesuit missionaries and was gradually implemented into the practice of European gardening, offering a deep understanding of nature and its forms. It was under the influence of the Chinese vision of nature that the English landscape park was formed, becoming a kind of antithesis to the French regular park dominant in Europe at that time. This style is quite justifiably defined today by many experts as "Anglo-Chinese". The concept of disengagement and naturalness in landscape "pictures" formed by lawns, hills, old trees and young groves, stones and ponds was based on the descriptions of travellers and missionaries and was nourished by picturesque views decorating the lacquer panels of screens and porcelain items.

The change in the aesthetic paradigm was manifested in the victory of the curved lines of paths, plants and architectural forms over the straight lines of a regular park. It is worth mentioning the treatise "The Analysis of Beauty" (1753) written by William Hogarth, which

[36] The Palace of Count Vorontsov in Alupka (Crimea), built in 1828–1846 for Prince Mykhailo Semenovych Vorontsov, served as a summer residence for his family. Since 1921, this palace and park ensemble has enjoyed the status of an architectural monument under government protection.

became the theoretical basis for this new vision of beauty.[37] In Ukraine, this landscape gardening version of chinoiserie was developed by landscape architects invited from Europe. Among them there were the Irish architect Dionysius McClair (Mikler in the nineteenth-century documents), who designed approximately 50 parks in the lands of modern Ukraine; French architect Muffet; Italian architect Domenico Botani; Lviv resident August Stange; Polish architect Bartecki; German architects Witt and August Jens; and the Czech architect Ranger.

The owners of estates and manors liked the idea of creating landscape paintings that corresponded to the natural Ukrainian landscapes with their plentiful mixed and leafy forests, vast meadows and various bodies of water. Among the few landscape parks in the Anglo-Chinese style that have survived to this day, we note the Arboretum 'Oleksandria' in Bila Tserkva, which belonged to the Branicki family,[38] and the Arboretum 'Sofiivka' in the estate of Count Potocki in Uman.[39] In these parks, small "Chinese" pavilions and bridges, as seen in Chinese "mountain–water" landscape paintings, symbolise the presence of man. The types of "Chinese" pavilions that appear in Ukrainian parks (Figs 19–20) are quite diverse and we must agree with Y. Liu that they have very little in common with their prototypes in China.[40] As Ivashko et al. rightly note, "Even when the architects tried to embody certain Chinese features in constructions for Chinese gardens (as in Tsarskoe Selo), they approached the design from the standpoint of a European".[41]

In our opinion, this is due to the lack of understanding of the Chinese order system *dou gong*, the basis of architectural design. Since European masters were inspired primarily by images of gazebos depicted in scrolls, screens and vase paintings, they developed them using familiar means, trying to achieve the external effects of line curvature reminiscent of the curves of ceilings and bridges. In the end, the Chinoiserie style did achieve the literal reproduction of Chinese forms but rather operated with images of the magical East, mostly imaginary and whimsical. In some cases, Chinese pavilions performed additional functions. For example, in Arboretum 'Oleksandria', the gazebo is an integral part of the dam bridge (Fig. 20). Among the typologies of chinoiserie-style pavilions preserved in European parks cited by researchers, we do not find similar examples.[42]

Arranged artificial waterfalls and ponds with lilies – which were supposed to resemble lotuses, symbolising purity in China and revered in Buddhist philosophy[43] – continued the array associations with Chinese landscapes.

We also note that there are examples reminiscent of famous chinoiserie monuments in Western Europe. For example, the sculptures that completed the design of the "Chinese"

[37] HOGARTH, William. The Analysis of Beauty. London: Printed by John Reeves for the Author, 1753. 135 pp. Available: https://archiv.ub.uni-heidelberg.de/artdok/1217/1/Davis_Fontes52.pdf

[38] Arboretum 'Oleksandria', named after the owner, Oleksandra Branicka, is the largest dendrological park in Ukraine that has survived to this day. The period of active construction was 1793–1840s.

[39] Sofiivka Park (*Ukr.* Sofiivskyi Park; *Pol.* Park Zofiówka, *also* Sofijówka, *as well as known as* Park w Zofiówce) is an arboretum named by Count Stanislaw Szczęsny Potocki in honour of his wife, Zofia Potocka. The period of active construction was 1796–1840s.

[40] LIU, Yu. The Importance of the Chinese Connection: The Origin of the English Garden. In: *Eighteenth-Century Life*, Vol. 27, No. 3, 2003, pp. 70–98.

[41] IVASHKO et al., Specifics of stylised shapes of Chinoiserie-style pavilions as the basis of their restoration…p. 39

[42] FEKETE, Albert & GYORI, Peter. Chinese pavilions in the early landscape gardens of Europe. In: *Landscape Architecture and Art*, *18*(18), 2021, pp. 78–87.

[43] YANKOVSKA, Dariia. On some preconditions and evolving of Eastern influences upon European fashion of the XVIII to early XX centuries. In: *The Ethnology Notebooks*, No. 5 (119), 2014, pp. 1018.

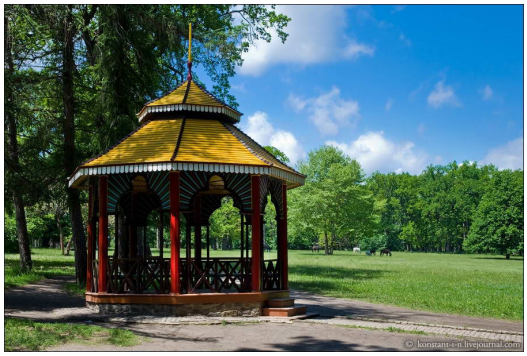

Fig. 19: *Chinese gazebo, 1841. The Arboretum 'Sofiivka'. Uman, Cherkasy region.* Recent photograph.

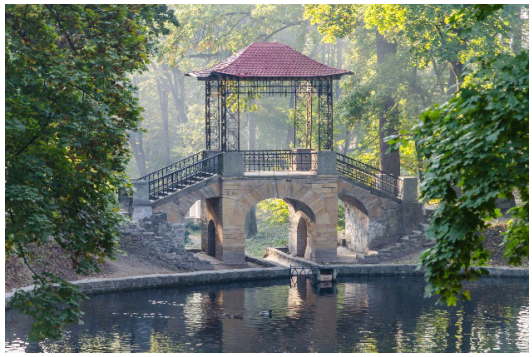

Fig. 20: *Chinese bridge. Late eighteenth to early nineteenth c. Reconstructed by architect D. Kryvoruchko (1863). The Arboretum 'Oleksandriia'. Bila Tserkvaa, Kyiv region.* Recent photograph.

location in Arboretum 'Oleksandria' are, to a certain extent, reminiscent of characters depicted on the Tea Pavilion in Sans Souci (Potsdam, Germany). The original sculptures have not been preserved (unlike the Pavilion); today, they have been replaced by bronze figures created by a contemporary artist which only vaguely resemble the originals, since the only sources for such a reconstruction – watercolour drawings by Willibald Richter dated 1830 – do not clearly convey the three-dimensional models. At the same time, Richter's paintings do indicate that the sculptures were polychrome, and that there was a small flag on the roof of the Pavilion (Figs 21–22).

We also note the presence of zoomorphic images typical of East Asian culture and art in the sculptural decorations of the parks. The manor in Samchyky is decorated with guardian lions: paired sculptures installed on both sides of the entrance to the palace (Fig. 23). In Sofiivka, there is a fountain in the form of a snake, from whose mouth a stream of water flows. This figure is a kind of connotation of the dragon (Fig. 24).

Over the period spanning the 1917 Russian Revolution, the Civil War and Soviet times, the former noble estates of Left-Bank Ukraine suffered an even sadder fate than those on the Right Bank, undergoing significant destruction and disfigurement. The fact that their owners also paid tribute to the Chinoiserie style in the design of exteriors and interiors, gardens and parks is only known from the work of local historian and artist Georgii Lukomskyi and a very few photographs. In particular, G. Lukomskyi, in his work *The Old Estates of Kharkiv Province*, published in 1917, gives examples of estates of the eighteenth century belonging to the Markevych and Kukol-Yasnopolskyi families. In the first case, he recalls stoves decorated with ceramic tiles in the Chinoiserie style, and in the second he writes of "a very stylish and curious Chinese gazebo" among the park and garden houses.[44] The architectural and artistic design of the latter is reminiscent of the Chinese pavilion at Chateau de Grousset, France. It is noteworthy that the aroma of chinoiserie permeates the entire publication dedicated to the estates of eastern Ukraine thanks to the headpieces by Heorhii Narbut, executed in the style of a silhouette drawing.

Describing oriental motifs in the Kharkiv urban and artistic environment, T. Lytovko points to the diversity of their manifestations. Owing to local porcelain and earthenware production,

[44] LUKOMSKII, Georgii. *Starinnyie usadby Kharkovskoi gubernii*. Kharkov: Kharkovskii muzei gorodskoi usadby, 2015, p. 94.

Fig. 21-22: Willibald Richter. *The Arboretum 'Oleksandriia'. Chinese bridge.* 1828. Watercolour, paper.

Fig. 23: *Giovanni Battista Savigliano (?) Statues of Guarding Lions. Manor in Samchyky. Early nineteenth c.*

Fig. 24: *Unknown author. Fountain 'Snake'. The Arboretum 'Sofiivka'. 1852–1859. Uman.*

paintings and printed materials, chinoiserie went beyond the boundaries of the estate world and settled into the bourgeois environment. Even urban public buildings bear chinoiserie features, such as the levelling basin for supplying water in Kharkiv, captured in a photo of 1881, which has the shape of a Far Eastern temple with a characteristic roof.

The democratisation of chinoiserie affected household products. The townspeople of the nineteenth century decorated their home spaces with carpets. Among the inexpensive products designed to offer comfort and please the eye were Poltava rugs, which combined expressive Turkish and Chinese elements. One of these samples, kept in the collection of KhAM, depicts figures of people in turbans and Chinese hats, with a tent and a Chinese gazebo are located in one compositional space. The frame formed by images of roses, popular in embroidery at that time, adding local flavour to the work and introducing it into its context.

Thus, in the lands of modern Ukraine, chinoiserie was presented in the contexts of Rococo, Classicism and Eclecticism. Its high adaptability can be seen in the wide range of applications of chinoiserie elements – from architecture, landscape gardening and high-quality handicraft items to products designed to meet mass-demand.

Conclusions

Analysis of the visual and textual materials discussed in this article allows us to assert that chinoiserie, as a European style in the lands of modern Ukraine, became most widespread in the nineteenth century, representing more restrained forms, delicately diversifying the severity of classicism. In the Ukrainian version of chinoiserie, the most popular form was floral motifs: images of flowers with birds and flowers in vases which correlated with traditional motifs found in folk murals, coming together with these in a favourable symbolism. We also find typical elements of the style such as butterflies, paired lions and dragons (sometimes snakes in the local interpretation).

Some of the Chinoiserie-style interiors represented approaches typical of European practice: wooden panels with decorative inserts, porcelain items on shelves, dominant items with an expressive Chinese motif: a screen or a small lacquer closet. There are also combinations of true Chinese and Chinoiserie items, or the combination of Chinese and Japanese or Chinese and Turkish motifs, within the structure of a single composition.

Features of the Ukrainian landscape and the picturesque nature of artistic thinking were consonant with the Anglo-Chinese style in the art of landscape gardening, creatively interpreted in the local context.

Summarising the above, we note that chinoiserie in the architectural monuments of Ukraine, as a component of a broader phenomenon of Orientalism, was not merely characterised by the use of oriental motifs reflecting the skin-deep, separated-from-reality perception of the countries of the East or the borrowing of European samples: there was also reinterpretation on the local soil. The popularity of chinoiserie, which spread with a certain time lag from European countries, may be explained by the desire to somewhat diversify the monotony of classicism dominant in urban development.

Prospects for further research are seen in the analysis of the further development of Chinese motifs, the use of Chinese experience by artists of modernist and postmodernist movements, and chinoiserie inspirations in modern art and design practices.

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Specificities of the presentation of open-air museums in selected countries of Central and Eastern Europe[1]

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Specificities of the presentation of open-air museums in selected countries of Central and Eastern Europe
The article analyses the idea of open-air museums in selected countries of Central and Eastern Europe while aiming to identify and name the varied focus and specificities of their presentations. These institutions typically combine two concepts: the monument concept, which relates to the protection and presentation of architecture, and the museological concept, which includes the "revival" of these sites through presentation and educational means. A living museum, living history, presenting everyday life, crafts, handcrafts, agricultural work, but also revived technological and military objects, have an inestimable place in the system of modern museum culture.

Keywords: open-air museums, open-air ethnographic expositions, Central and Eastern Europe

Introduction

Open-air museums have been a part of museum culture for more than 130 years now, and practically from their beginning, they have ranked among the most successful and most

[1] Specifický výzkum MUNI/A/1562/2024 „*Muzejní prezentace III - prezentace specializovaných sbírek*".

visited museum institutions. They conserve and embody a specific national or regional identity, a historical ecosystem, and in many ways they are irreplaceable. The origin of this type of museum is linked to the end of the 19th century and the countries of Scandinavia, from where they spread further into Europe. Their founding was associated mainly with the effort to protect buildings of folk housing and to preserve them from possible extinction. Therefore, not only are classic museum approaches based on the museological principles of preservation of cultural values applied in these museums, but also the principles of monument protection, since the exhibited objects have a dominant, though not exclusive, function in open-air museums. The modern understanding of open-air museums stresses the vibrancy of this institution, that is, the inclusion of demonstrations of activities, period crafts, agricultural or manual work, or other human activities and everyday life through visual examples or by the revival of the given site. This is why such museums are often described as "living museums". Our article sets its sights on analysing the concept of open-air museums in selected countries of Central and Eastern Europe, identifying their varied focus and specificities of presentation in the studied region, and defining certain characteristic or common features that distinguish them from this type of museums in other regions. At the centre of attention mainly stand the countries of the Visegrad Group, or V4 (Czech Republic, Slovak Republic, Poland, Hungary), as well as the Baltic countries and Ukraine.

A brief history of the development of open-air museums

When the so-called world exhibitions began being organised in the middle of the 19th century, among the exhibits of interest were not only various models, but also reconstructed interiors of traditional building of folk architecture from several countries. The Vienna World's Fair in 1873 directly presented visitors with a group of folk buildings.[2] These initiatives, which were further deepened by ethnographic exhibitions in Europe, contributed to the origin of a special type of museum facility – open-air museums.

Swedish ethnographer Artur Hazelius is most often mentioned in connection with the founding of this type of museum. It was he who in 1891 organised and opened to the public under the name "Skansen" what is undoubtedly today the world's most famous open-air museum, located on the island of Djurgarden, near Stockholm.[3] Hazelius, who had earlier presented the interior of a Scandinavian room at the Exposition Universelle, or Paris Exhibition (1878),[4] was probably also inspired by the Norwegian collection of folk buildings that King Oscar II, as the patron of the emerging complex, had opened to the public in Bygdøy, near Oslo, in 1881.[5] Bygdøy was built as a public park as early as 1837, and space was set aside in its centre for rustic wooden buildings. Mentioned in association with this are Christian Holst and especially Nicolay

[2] ŠTIKA, Jaroslav; LANGER, Jiří. *Československé múzeá v prírode*. Martin, Ostrava: Osveta, Profil, 1989, pp. 7–8.

[3] JANOŠTÍNOVÁ, Marianna. Múzeum v prírode – fenomén rôznosti. In: *Múzeá v prírode : Koncepcie, realita a vízie*. Čadca: Kysucké múzeum, 2019, pp. 7–8; RYCHNOVÁ, Lucie; MATURKANIČ, Patrik; SLOBODOVÁ NOVÁKOVÁ, Katarína; PAVLÍKOVÁ, Martina. Open-air Museums – the Future of the Presentation of Spiritual and Architectural Heritage. In: *Muzeológia a kultúrne dedičstvo*, vol. 10, 2022, Is. 1, p. 6, DOI: https://doi.org/10.46284/mkd.2022.10.1.1; PEDERSEN, Ragnar. *Hedmarksmuseet 100 år. 1906–2006*, Hamar 2008; RENTZHOG, Sten. *Open Air Museums : The history and future of a visionary idea*. Kristianstad : Jamtli Förlag, 2007, p. 5.

[4] ŠTIKA, Jaroslav; LANGER, Jiří. Československé múzeá..., p. 7.

[5] FREDERIKSEN Bjørn; MØRCH, Monica. King Oscar II's collection of authentic medieval houses at Bygdøy, Oslo. In: *Bulletin för trädgårdshistorisk forskning*, vol. 2017, No. 30, p. 13; GAILEY, Alan. Domesticating the Past: The Development of Open-Air Museums. In: *Folk Life*, vol. 38, 1999, No. 1, p. 7, DOI: https://doi.org/10.1179/flk.1999.38.1.7.

Nicolaysen, who was involved in the creation and presentation of a collection of archetypes of Norwegian wooden architecture, probably the world's first and thus oldest open-air museum project. That collection was established by moving five historic buildings – dating from the 13th to 18th centuries – from different parts of Norway into the emerging collection.

In contrast to this, Hazelius's Skansen was built with the aim of comprehensively presenting the life of the peasant population, not only by transporting folk buildings and their equipment, but also the effort to alter their original surroundings. Hazelius gradually added spiritual culture to this concept, which was represented by dance, music or the spoken word, which, together with living people dressed in period costume, created an atmosphere that conveyed the history of traditional life in Sweden. Hazelius thus combined culture, nature, the material and spiritual sides of the society's life, including space for education about the history of the common life of rural people in Sweden.[6] This idea then spread quickly, thanks especially to great interest of the public. Open-air museums were at first established mainly in Scandinavian countries,[7] where they are an important part of the cultural landscape.[8] However, this type of museum gradually began to spread to other parts of Europe.

Museums that originated on the model of the Swedish Skansen were mainly focused on ethnography, rural culture and everyday country life. In 1909, the museum "Den Gamle By" (The Old Town), which we consider to be the oldest presentation focused on urban culture, was founded in the Danish town of Aarhus. Today Den Gamle By consists of some 75 buildings from towns and cities all over Denmark and presents four different time periods of urban living (1864, 1927, 1974 and 2014). The houses present period rooms, shops and workshops as well as a demonstration of living history.[9]

Along with such ethnographically oriented open-air museums, institutions of a different stamp also later began to emerge. Starting in the 1960s and 1970s, open-air archaeological museums, so-called archaeoskansens or archaeoparks, focused on presenting the life of the oldest societies, documenting them on the basis of archaeological research and findings, also gained popularity among the public.[10] These were initially founded as a result of experimental archaeology, which attempted to confirm various hypotheses about production techniques in the past through experimentation. In this case, too, the effort was mainly to show the everyday life of society, but here, with exceptions, historical reconstructions usually take place,

[6] RING, Herman A. *Skansen och Nordiska museet anläggningar å Djurgården*. Stockholm : Samson & Wallin, 1893, pp. 8–14; JANOŠTÍNOVÁ, Marianna. Múzeum v prírode..., pp. 7–8; GAILEY, Alan. Domesticating the Past: The Development of Open-Air Museums. In: *Folk Life*, vol. 38, 1999, No. 1, p. 9, DOI: https://doi.org/10.1179/flk.1999.38.1.7.

[7] *Comparing: National Museums, Territories, Nation-Building and Change*, ARONSSON, Peter, NYBLOM, Andreas (eds.), Norrköping 2008; RENTZHOG, Open Air Museums..., pp. 34–38.

[8] HOL HAUGEN, Bjørn Sverre. The museum that never came into being – a contribution to the history of regional folk museums. In: *Norsk museumstidsskrift*, vol. 5, 2019, No. 02, p. 141; WELLE-STRAND. Erling. *Museums in Norway*. Oslo 1974.

[9] BLOCH RAVEN, Thomas. Updating Den Gamble By: History and Future of a 100-year-old Open Air Museum in Denmark. In: *Acta Ethnographica Hungarica*, vol. 55, 2010, No. 2, p. 313, DOI: https://doi.org/10.1556/AEthn.55.2010.2.3; https://www.visitaarhus.com/aarhus-region/plan-your-trip/den-gamle-old-town-museum-gdk631880 [accessed, 30.10.2024]. Today Den Gamle By consists of some 75 buildings from towns and cities all over Denmark. The houses present period rooms, shops, workshops, living history. DJUPDRÆT, Martin Brandt. The importance of atmosphere and spatiality in creating social experiences. In: *Museologica Brunensia*, vol. 8, 2019, Is. 1, pp. 2–12. DOI: https://doi.org/10.5817/MuB2019-1-1.

[10] These institutions have established a special international organisation: International Organisation of Archaeological Open-Air Museums and Experimental Archaeology. https://exarc.net/ [accessed, 31.10.2024].

again with the aim of reconstructing the original environment.[11] Similarly, open-air museums focused on military, technological or industrial expositions (e.g., water and windmills, open-air mining museums, areas of military fortifications, etc.), or with some other orientation, were founded and presented in the open air.[12] A feature of open-air museums is a specific type of presentation, the so-called "living museum",[13] which is characterised by elements of ongoing activities, e.g., the demonstration of different handicrafts, often brought to life by real people as well as domestic animals which were typical of rural life, mainly in open-air archaeological museums through the implementation of living history mediating for visitors.

Development in the founding of open-air museums took place in Scandinavian countries particularly after 1910. This mainly involved Norway, Sweden and Denmark, but also the Netherlands and Finland.[14] For example, this period witnessed the formation of one of Norway's largest open-air museums – Glomdalsmuseet, formerly called Østerdalsmuseet – which is located by the River Glomme in the town of Elverum.[15] Glomdalsmuseet was built gradually. It was opened to the public in 1911, and today the exhibition comprises 92 buildings (residential interiors, farm rooms and craft workshops) from the period 1612–1940. The museum's collections (40,000 objects and more than 80,000 photographs) document the history of trade and crafts as well as social life, military service and the development of medicine in the Østerdalen and Solør regions.

In Finland, a national open-air museum was founded in Seurasaari as early as 1909,[16] and open-air museums from Scandinavia quickly spread to northern Germany, too. The first attempts at institutionalisation here began at the turn of the 20th century, starting with the Rhineland-Palatinate Museum in Kommern, which was focused on traditional farming, horticulture and domestic animal breeding.[17] In the neighbouring Netherlands, the Netherlands Open Air Museum (Nederlands Openluchtmuseum) was founded in Arnhem in 1912, focusing on the traditional craftsmanship of millers, blacksmiths and printers.[18]

The oldest Polish ethnographic open-air museums likewise have their roots in the earlies years of the 20th century. The Kashubian Ethnographic Park (Kaszubski Par Etnograficzny), founded in 1906, and the Museum of Folk Architecture – Ethnographic Park in Olsztynek (Muzeum Budownictwa Ludowego – Park Etnograficzny w Olsztynku), from 1909, are

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[11] PAARDEKOOPER, Roeland. *The valuse of an Archaeological Open-Air Museum is in its use. Understanding Archaeological Open-Air Museums and their Visitors*. Leiden: Sidestone Press, 2012, pp. 27–31; DRAGOUN, Bohumír. Několik poznámek k budování a provozu archeologického muzea v přírodě. In: *(Re)konstrukce a experiment v archeologii – Živá archeologie*. vol. 7, 2006, p. 88.

[12] DRÁPALA, Daniel. Definicie muzea v přírodě a limity jejího naplňování. In: KUMINKOVÁ, Eva (ed.). Muzea v přírodě : Jedinečná cesta muzejnictví. Rožnov pod Radhoštěm: Národní muzeum v přírodě, 2019, p. 18; BRYOL, Radek. Vymezení metodických zásad zakládání a činnost muzeí v přírodě. In: KUMINKOVÁ, Eva (ed.). Muzea v přírodě : Jedinečná cesta muzejnictví. Rožnov pod Radhoštěm: Národní muzeum v přírodě, 2019, p. 35.

[13] OLINSSON, Sascha Bjarnø. A Museology for Open-Air museums. In: *Journal of Conservation and Museum Studies*, vol. 21, 2023, No. 1, pp. 2–3, doi: https://doi.org/10.5334/jcms.223.

[14] GAILEY, Alan. Domesticating the Past: The Development of Open-Air Museums. In: *Folk Life*, vol. 38, 1999, No. 1, p. 11, DOI: 10.1179/flk.1999.38.1.7; RENTZHOG, Open Air Museums..., pp. 40–41.

[15] HOL HAUGEN, Bjørn Sverre. The museum that never came into being – a contribution to the history of regional folk museums. In: *Norsk museumstidsskrift*, vol. 5, 2019, No. 02, p. 153.

[16] https://www.kansallismuseo.fi/en/seurasaarenulkomuseo [accessed, 31.10.2024].

[17] ŠTIKA, Jaroslav; LANGER, Jiří. Československé múzeá..., p. 15.

[18] https://www.openluchtmuseum.nl/ontdek?taal=nl [accessed, 31.10.2024].

Fig. 1-4: *View of historic wooden buildings in the Glomdalsmuseet open-air museum (Norway).* Photo by Dominika Kuśnierz-Krupa, 2024.

considered to be the oldest.[19] In Central and Eastern Europe, however, such museums began to appear only during the interwar period, though often these were long-planned concepts and ideas that dated back to the end of the 19th or start of the 20th century. A good example of this is the ethnographic museums in what is today the Czech Republic, where the first initiatives and ideas for such a museum were linked to the Jubilee Exhibition in Prague (1891), where a "Czech cottage"[20] was presented, but particularly to the Czechoslovak Ethnographic Exhibition in 1895. During the preparation for this exhibition, an "exhibition ethnographic village" was created representing the folk housing of several regions not only of Czechia, but of neighbouring Slovakia, too.[21] In Czechia, the Polabské Ethnographic Museum in Přerov nad Labem, which is linked to the previously mentioned ethnographic exhibition, has the oldest tradition.[22] After the establishment of Czechoslovakia, the distinguished Wallachian Open Air Museum was founded in Rožňov pod Radhoštěm in 1925, and for a long time it was a model for the creation of similar facilities in Czechia and Slovakia. A year before that, the Ethnographic Open-Air Museum of Latvia (Latvijas Etnogrāfiskais brīvdabas muzejs) was established in Latvia, and since 1924 up to 118 historical buildings have been collected there in Riga, documenting housing from all the regions of Latvia.[23] In Romania, the "Dimitrie Gusti" National Village Museum (Muzeul Național al Satului "Dimitrie Gusti") was established in Bucharest in 1936 and named after Professor Dimitrie Gusti, who designed it. Along with the individual buildings, he also moved original peasant families into the museum, and they continued to live in the buildings.[24]

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[19] TOMASZEWSKI, Filip; WALCZAK, Bartosz M. An operational windmill in an open-air museum as a conservation challenge: Lessons from projects recently implemented in Poland. In: *Muzeológia a kultúrne dedičstvo*, vol. 12, 2024, Is. 3, p. 78, DOI: https://doi.org/10.46284/mkd.2024.12.3.6.

[20] *Sto let práce. Zpráva o všeobecné zemské výstavě v Praze 1891. Na oslavu jubilea první průmyslové výstavy z roku 1791 v Praze.* Praha 1873, pp. 207–208.

[21] ŠTIKA, Jaroslav; LANGER, Jiří. Československé múzeá..., pp. 18–24.

[22] Ibidem, p. 27.

[23] http://brivdabasmuzejs.lv/en/museum/museum-history/ [accessed, 31.10.2024].

[24] https://muzeul-satului.ro/despre-noi/istoric-muzeul-satului/ [accessed, 31.10.2024].

In the period after the Second World War, particularly in association with the construction of landscape museums, the concept of open-air museums changed, when newly emerging institutions stressed monument-building approaches, with the main aim of protecting architectural objects. The presentation activities in such museums were manifested mainly by the emphasis placed on the scientific nature of the collections. In contrast, the concentration on this aspect led to a retreat from expressions of national and regional traditions and having an emotional impact on the visitor. The strict scientific nature of these expositions effectively meant that these museums became "inanimate" for visitors.[25] The concept in the collection-building activities was changed by creating chronological and typological sequences, and presentation activities were focused on presenting the community as a whole with the differentiation of social conditions. In the 1970s, however, this concept was modified, namely due to foreign influences, from a focus on presenting objects to a focus on the people who once used the presented objects. In this period, a story linked to the people who had lived in the buildings was added to the important presentation elements.[26] In museum grounds, therefore, we come across various craft workshops (for example, a blacksmith, tailor, shoemaker, painter), food operations (a dairy, bakery, butcher), civic amenities (a church, school, inn, shop, fire station), the dwellings of various social groups, and also with industrial architecture. Open-air museums have thus become not only museums presenting monuments of cultural heritage, but likewise attractive recreation facilities. As an example, we can mention the better-known Norwegian museum Domkirkeodden in Hamar, where examples of traditional building from the Hedmark region from the 18th and 19th centuries, installed in the years 1912 – 1914 from the Oppland Folk Museum, founded back in 1906.[27] Along with the monuments of traditional Norwegian architecture, the area is home to the relics of an early medieval cathedral from the mid-12th century, built as a basilica in the Romanesque style, which is roofed over by a modern glass structure.[28] Another attraction for visitors is also the reconstructed and modified barn from the 18th century, called Storhamarlåven, which was built on the ruins of the Hamar bishop's palace, which was destroyed in the 18th century. The restoration and alteration of this unit was done by the world-famous Norwegian architect Sverre Fehn.[29] The presentation is accompanied and animated by, among other things, the Gregorian chant of the guides and the use of unique acoustics in the interior of the "glass cathedral".

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[25] JANOŠTÍNOVÁ, Marianna. Múzeum v prírode..., pp. 9-10; VOJANCOVÁ, Ilona. Způsoby prezentace, interpretace, edukace a oživování v muzeích v přírodě. In: KUMINKOVÁ, Eva (ed.). *Muzea v přírodě : Jedinečná cesta muzejnictví*. Rožnov pod Radhoštěm: Národní muzeum v přírodě, 2019, p. 142.

[26] JANOŠTÍNOVÁ, Marianna. Múzeum v prírode..., p. 11; Muzea v přírodě. In: *Lidová kultura* [online]. Strážnice: Národní ústav lidové kultury, 24. 10. 2024 [accessed, 29.10.2024]. Available from www: <https://www.lidovakultura.cz/prezentace/muzea-v-prirode/>.

[27] PEDERSEN, Ragnar. *Hedmarksmuseet 100 år. 1906–2006* , Hamar 2008; Hedmarksmuseet og Domkirkeodden Hamar. Historikk og årsmelding 1937-39. Hamar 1940; Toaars-beretning 1935-37. Hamar 1937; HOL HAUGEN, Bjørn Sverre. The museum that never came into being – a contribution to the history of regional folk museums. In*: Norsk museumstidsskrift*, vol. 5, 2019, No. 02, pp. 141–155.

[28] KRUPA, Michal. Revaluation of Hamar Cathedral as an example of modern creation of historical ruins. In: *Czasopismo Techniczne. Architektura*, vol. 106, is. 13 – 3A, 2009, pp. 97–112.

[29] KUŚNIERZ-KRUPA, Dominika; KRUPA, Michal. Współczesne sposoby rewaloryzacji i adaptacji ruin obiektów sakralnych w Europie (na wybranych przykładach). In: *Wiadomości Konserwatorskie*, 2006, No. 20, pp. 48–52; NILS, Mark. H*amar Cathedral ruins and the protective structure*, Oslo 2001; WALL, Maria. *Climate and Energy Use in Glazed Spaces*. Trondheim 1996; POSTIGLIONE, Gennaro – NORBERG SCHULZ, Christian. *Sverre Fehn*, 2007; POSTIGLIONE, Gennaro; NORBERG SCHULZ, Christian. *Sverre Fehn: Works, Projects, Writings, 1949-1996*, Michigan 2007.


Fig. 5-6: *View of wooden buildings from the 18th and 19th centuries in the Domkirkeodden open-air museum (Norway).* Photo by Dominika Kuśnierz-Krupa, 2024.

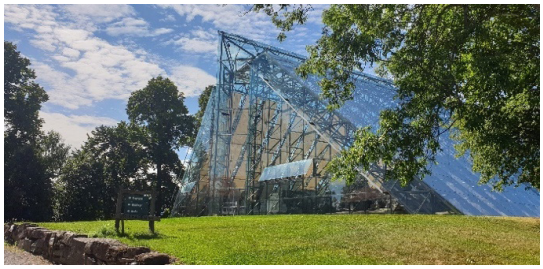
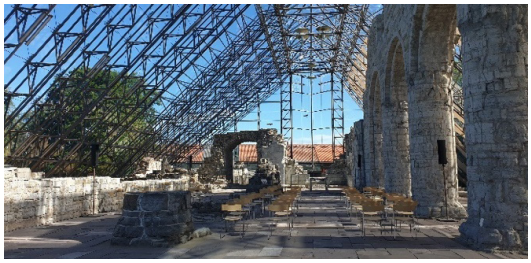

Fig. 7-8: *View of the ruins of the Hamar Cathedral covered with a modern glass structure.* Photo by Dominika Kuśnierz-Krupa, 2024.


Fig. 9-10: *View of the ruins of the former Storhamarlåven barn, converted into a museum, built on the remains of the bishop's palace.* Photo by Dominika Kuśnierz-Krupa, 2024.

In the post-war period, open-air museums were established in greater numbers and on the basis of well-considered concepts. Among the most important in Central Europe is certainly the open-air museum in Stübing, Austria, near the Styrian city of Graz (Freilichtmuseum Stübing). This Austrian open-air museum, which brings together architectural representatives from all federal states of the country, was founded in 1962 and opened to the public in 1970. The museum presents more than 100 objects, the oldest of which dates back to the 15th century.[30] A second major open-air museum in Austria, the Salzburg Freilichtmuseum, opened in 1984; it presents more than 100 objects from various areas of Salzburg. A nearly 2 km long historical railway is also an attraction for visitors there.[31] In neighbouring Switzerland, the Freilichtmuseum Ballenberg, founded in 1978 with over 100 typical architectural objects from all over Switzerland, has become an important museum. The presentation of the buildings here is complemented not only by numerous domestic animals, but also by demonstrations of handicrafts, such as basket making, forging, knitting, spinning, weaving and woodcarving.[32]

[30] https://www.museum-joanneum.at/freilichtmuseum/ueber-uns/geschichte [accessed, 31.10.2024].
[31] https://www.freilichtmuseum.com/en/the-museum.html [accessed, 31.10.2024].
[32] https://ballenberg.ch/de/ueber-uns-flm/museumsgeschichte/ [accessed, 31.10.2024].

Open-air museums in Central and Eastern Europe

In Central and Eastern Europe, in the countries of the former Eastern Bloc, open-air museums were founded mainly from the 1960s to the 1980s, where efforts to protect and revive respect for regional and national traditions began to being expressed. A stronger impulse in this regard was the work of Jerzy Czajkowski from the Rural Architecture Museum of Sanok (Muzeum Budownictwa Ludowego w Sanoku), which was established in 1958 as a national museum of this type in Poland.[33] The decision to support the construction of open-air museums, adopted in 1956 by the ICOM General Assembly in Geneva, also had a positive effect in this direction. Professional discussions ultimately led in 1957 to a special Declaration on Open-air Museums,[34] which accepted these facilities as a collection and exhibition, if the original buildings no longer exist and if the reconstruction work is done by strictly academic methods.

Fig.13: *Rural Architecture Museum of Sanok (Poland)*, Photo by Pavol Tišliar, 2022.

Sanok is the largest open-air museum in Poland, though it is not the oldest one. Its exposition is divided into 4 villages and presents more than 200 objects, mainly dating from the 17th to the 20th centuries. Of particular interest here is the reconstruction of a Subcarpathian town centre with its square from the turn of the 19th century. However, it is far from being the only museum project of an ethnographic nature in Poland. According to the list of members of the Polish Association of Open-Air Museums (Stowarzyszeniem Muzeów na Wolnym Powietrzu

[33] https://skansen.mblsanok.pl/a/strona.php?id=strona [accessed, 31.10.2024].
[34] ŠTIKA, Jaroslav; LANGER, Jiří. *Československé múzeá...,* pp. 12–13.

w Polsce), 37 such facilities are operating in the country.[35] Among the more renowned open-air museums, the one in Nowy Sacz (Muzeum Ziemi Sądeckiej), where an ethnographic park was established in 1975, can be mentioned.[36] Several regionally focused museums operate here, e.g., the Opole Village Museum (Muzeum Wsi Opolskiej w Opole, 1961),[37] or the Mazovian Village Museum in Sierpc (Muzeum Wsi Mazowieckiej w Sierpcu,1985).[38] Poland is also home to several open-air museums which focus on technology and archaeology.

For Hungary, already rich in museum traditions, the founding of the open-air museum in Szentendre, near Budapest, had great importance. It was opened to the public in 1966, and its collection contains selected representatives of traditional Hungarian architecture from all over the country, presented in tandem with a rich display of objects in the interiors. This is one of the largest museum complexes in Central Europe, covering an area of 60 hectares, and it currently offers more than 400 objects, supplemented by several tens of thousands of different items.[39] Here, too, however, the idea of founding an open-air museum matured for a considerably longer time. As early as on the occasion of the so-called "Millennium Exhibition" in 1896, a so-called "ethnographic village" was presented, at first with 24 objects coming from different parts of historical Hungary. More than 60 years would pass, however, before open-air ethnographic museums began to arise in Hungary. Aside from the largest and most famous museum in Szentendre, we can mention other open-air museums in Zalaegerszeg (1968), Szombathely (1976), Nyíregyháza-Sóstón (1970), Ópusztaszer (1976) and Szenna (1982). The mentioned museums are based on historical-ethnographic authenticity, which means they offer authentic material, structures and equipment. The furnishings in them primarily expresses nationality and religious affiliation, the social status of the people who once lived in the buildings and the specifics of their employment and work.[40]

In the former Czechoslovakia, the Wallachian Open-Air Museum, located in Rožnov pod Radhoštěm, was for rather a long time the most important exposition of folk dwellings. Its founders were the Jaroněk brothers. Conceptually, the museum at first began with the presentation of town architecture, supplemented later primarily by the traditional folk architecture of the rural people in the area, where log houses of the Carpathian type occur in the Czech Republic, particularly from the Wallachia and Těšín Silesia regions. Additional open-air museums were set up only in the post-war period, and the museum in Rožnov stood as an important example. This museum has had a special status up to now, as together with the Haná Open Air Museum, the Vysočina Open Air Museum and the Zubrnice Open Air Museum, it comprises the National Open Air Museum.[41] The Czech Republic has a relatively large number of not only ethnographic museums (16), but also numerous archaeological open-air museums (13) focused on the periods from prehistoric times to the Middle Ages, or mining museums

[35] https://www.muzeaskansenowskie.eu/czlonkowie/#1517319461653-a4388c57-3ace [accessed, 1.11.2024].
[36] https://muzeum.sacz.pl/historia-muzeum [accessed, 1.9.2024].
[37] https://muzeumwsiopolskiej.pl/historia/ [accessed, 13.7.2024].
[38] https://mwmskansen.pl/muzeum-historia/ [accessed, 1.11.2024].
[39] https://visithungary.com/cs/clanky/ethnographic-museum-in-szentendre [accessed, 31.8.2024].
[40] *Szabadtéri néprajzi múzeumok*. [online]. https://www.arcanum.com/hu/online-kiadvanyok/MagyarNeprajz-magyar-neprajz-2/iv-eletmod-41AA/epiteszet-4399/a-nepi-epiteszeti-emlekek-vedelme-4771/szabadteri-neprajzi-muzeumok-4775/ [accessed, 1.3.2024].
[41] *Národní muzeum v přírodě* [online]. Rožnov pod Radhoštěm: Národní muzeum v přírodě [accessed, 29.7.2024]. Available from www: <https://nmvp.cz/>.

Fig. 14: *Modrá Archaeological Heritage Village (Czech Republic).* Photo by Pavol Tišliar, 2023.

focused on technology (24). As many as 103 sites are classified as objects of folk architecture with elements of an open-air museum.[42]

In Slovakia, the idea of having its own open-air museum appeared as early as the end of the 19th century. A leading representative of Slovak museology, Andrej Kmeť, was already thinking about establishing such a museum in the mid-1890s.[43] However, the first open-air museum in Slovakia only began being built at the Šariš Museum in Bardejov, and it was finally made accessible to the public in 1966. The exhibition here included wooden sacral architecture, specifically churches of the Eastern Rite from the 18th century. The first of these churches had been moved here as early as in 1936.[44] Due to its limited space, however, this museum did not become a national one. Instead, such a national museum began being built near Martin, a small town in which the Slovak National Museum – Ethnographic Museum is located. In the nearby location of Jahodnícke háje, the foundation of what is today the Museum of the Slovak Village gradually began being assembled starting in the mid-1960s; today it holds more than 150 representative buildings from the Liptov, Orava, Kysuce and Turiec regions.[45] Alongside these, several regional open-air museums were also created, focusing on presenting traditional

[42] See KUMINKOVÁ, Eva (ed.). *Muzea v přírodě: Jedinečná cesta muzejnictví*. Rožnov pod Radhoštěm: Národní muzeum v přírodě, 2019, pp. 220–223.

[43] JANKOVIČ, Vendelín. Dejiny pamiatkovej starostlivosti na Slovensku v rokoch 19850-1950. In: *Monumentorum tutela : Ochrana pamiatok*, vol. 10, 1973, p. 25.

[44] GUTEK, František. Skanzen v kúpeľoch. Genéza, súčasnosť a perspektívy Múzea ľudovej architektúry v Bardejovských kúpeľoch. In: *Múzeá v prírode : Koncepcie, realita a vízie*. Čadca: Kysucké múzeum, 2019, pp. 133–134; ŠTIKA, Jaroslav; LANGER, Jiří. Československé múzeá..., p. 28.

[45] JAŠŠOVÁ, Simona; SÁKORA, Radovan. Koncepcie a východiská výstavby Múzea slovenskej dediny. In: *Múzeá v prírode : Koncepcie, realita a vízie*. Čadca: Kysucké múzeum, 2019, pp. 49–54, 59.

life in the countryside, e.g., for the Kysuce (Vychylovka, 1974),[46] the Spiš and the Šariš regions (Stará Ľubovňa, 1985),[47] as well as the Orava (Zuberec, 1975),[48] Liptov (Pribylina, 1991), and north-east Zemplín regions (Humenné, 1984).[49] Particularly worth mentioning among such ethnographically oriented open-air museums is the Museum of Ukrainian Culture in Svidník, which belongs to the Slovak National Museum. This is a specialised workplace presenting the traditional life of north-eastern Slovakia over the last 150 years. The museum was opened to the public in 1986 and presents about 50 different objects.[50] Another open-air museum – the Open-Air Mining Museum in Banská Štiavnica, which focuses on the mining activity of the region – stands out in Slovakia due to its character.

Fig. 15: *SNM – Museum of Ukrainian Culture in Svidník (Slovakia).* Photo by Pavol Tišliar, 2022.

As elsewhere, particularly in Northern Europe, open-air museums in Czechoslovakia were primarily associated with the existence of ethnographic museology, i.e., they were

[46] KONTRIK, Alojz. Skanzen Vychylovka – história a súčasnosť. In: *Múzeá v prírode : Koncepcie, realita a vízie*. Čadca: Kysucké múzeum, 2019, p. 73.
[47] PAVELČÍKOVÁ, Monika. Múzeum v prírode pod hradom Ľubovňa. In: *Múzeá v prírode : Koncepcie, realita a vízie*. Čadca: Kysucké múzeum, 2019, pp.110–112.
[48] JANOŠTÍN, Richard. Pravidelné výchovnovzdelávacie programy pre návštevníkov Múzea oravskej dediny v Zuberci. In: *Múzeá v prírode : Koncepcie, realita a vízie*. Čadca: Kysucké múzeum, 2019, p. 178.
[49] FUNDÁK, Jozef. Expozícia ľudovej architektúry a bývania v Humennom – zvyšovanie komfortu pre návštevníkov, opravy a ochrana objektov. In: *Múzeá v prírode : Koncepcie, realita a vízie*. Čadca: Kysucké múzeum, 2019, p. 160.
[50] DŽOGANÍK, Jaroslav. Skanzen SNM – Múzea ukrajinskej kultúry vo Svidníku: realita tradície a perspektíva modernity. In: *Múzeá v prírode : Koncepcie, realita a vízie*. Čadca: Kysucké múzeum, 2019, p. 172.

associated with folk culture and rural architecture, and this stereotype still prevails today.[51] Other institutions, such as archaeological museums or technological monuments, have a similar cultural purpose and methodological foundations. In countries where there were no significant ideological boundaries between different social strata or historical epochs at the time open-air museums were founded, their activities are conceived with regard to a more complex cultural environment. For example, in Polish open-air museums the interweaving of social strata is evident, where adjacent to rural buildings we can also find representative seats of the small nobility with manicured gardens and extensive agricultural facilities. The Sądecki Ethnographic Park in Nowy Sącz, Poland, can serve as an example. In the former Czechoslovakia, the inclusion of a noble residence in the concept of an open-air museum was rather an exception, a practical step for accumulating several monuments or to emphasise the contrast between the presented social categories. An example is the previously mentioned open-air museum in Stará Ľubovňa, Slovakia, which presents Stará Ľubovňa Castle and the open-air museum of traditional architecture in the grounds beneath Stará Ľubovňa castle.[52] These and similar reasons are not present in many open-air museums in Western Europe, however, where in a comprehensive environment, in addition to reconstructed country houses, there are also industrial enterprises (Frilandmuseet Lyngby), urban buildings (Norsk Folkemuseum), or noble residences (St. Fagans National Museum of History in Wales).[53] This does not mean that there are no museums that are unilaterally focused, e.g., on the urban environment in the already mentioned Danish museum Den Gamle By, or with an industrial focus, as in the Black Country Living Museum in England, or through cooperation with archaeologists, when presenting the Middle Ages, during which a reconstruction takes place.

This brief overview would not be complete without mentioning the national associations, unions and groupings of open-air museums, which are present in all the mentioned countries, across Europe. In the Czech Republic, aside from the Methodological Centre for Open-Air Museums, which was founded by the Ministry of Culture of the Czech Republic,[54] there is also the Czech Association of Open Air Museums (Český svaz muzeí v přírodě). Likewise, in Poland the Stowarzyszenie Muzeów na Wolnym Powietrzu w Polsce (Association of Open Air Museums in Poland) covers both national and foreign cooperation in that country.[55] In Slovakia, the Union of Open-Air Museums (Únia múzeí v prírode) works with the Union of Museums in Slovakia (Zväz múzeí na Slovensku).[56] On the international level, the Association of European Open Air Museums (AEOM), which creates a platform for the sharing of experiences, the organising of thematic academic events and the promotion of open-air museums throughout Europe, was founded in 1966.[57] It is this sharing of experiences that leads to many of the differences in the activities of open-air museums being more and more often wiped away and balanced.

In the countries of the former Soviet Union, space was more significantly devoted to open-air museums in the Baltic countries, but also in what is today Ukraine. Of interest, aside

[51] BRYOL, Radek. Vymezení metodických zásad zakládání a činnost muzeí v přírodě. In: KUMINKOVÁ, Eva (ed.). *Muzea v přírodě : Jedinečná cesta muzejnictví*. Rožnov pod Radhoštěm: Národní muzeum v přírodě, 2019, p. 34.
[52] PAVELČÍKOVÁ, Monika. Múzeum v prírode..., pp. 105-120.
[53] BRYOL, Radek. Vymezení metodických zásad..., p. 35.
[54] *Metodické centrum pro muzea v přírodě* [accessed, 29.10.2024]. Available from www: <https://muzeavprirode.cz/>.
[55] https://www.muzeaskansenowskie.eu/ [accessed, 29.10.2024].
[56] https://unmup.zms.sk/ [accessed, 23.10.2024].
[57] https://theaeom.org/ [accessed, 31.10.2024].

from the already mentioned Latvia, is Estonia, in which the Estonian Open-Air Museum (Eesti vabaõhumuuseum), founded in 1957, presents everyday life and traditional Estonian architecture not only from the 19th century, but also from the 20th and 21st centuries, and the individual periods are shown in contrast with one another.[58] The presentation of newer types of dwellings or buildings in this way is decidedly not typical for most ethnographically orientated museums in Europe. Eventually, the Museum of Lithuanian Ethnography (Lietuvos etnografijos muziejus) was also founded in Lithuania in 1966 and opened to the public in 1974. The museum's exposition is concentrated on folk architecture but also reflects national and regional customs and holidays.[59]

Fig.16: *Housing of the Middle Dnipro region (Ukraine).* Photo by Yulia Ivashko, 2021.

Ethnographic open-air museums likewise predominate in Ukraine. Among the most well-known such museums in Ukraine is the National Museum of Folk Architecture and Life in Uzhhorod, in the Transcarpathian region (Закарпатський музей народной архитектучи та побуту), which in terms of area is perhaps the largest in Europe (up to 131 hectares) and presents traditional architecture from the 16th to the 20th centuries.[60] The "Shevchenko Hai" Ethnopark in Lviv (Шевченківський гай, Львів), which presents more than 100 traditional buildings representing Western Ukraine and whose roots reach back to the 1970s, can also be mentioned.[61] The oldest open-air museum, however, is the Museum of Folk Architecture and Life of Middle Dnipro Ukraine in Pereiaslav, in the Kyiv region (Музей народной архитектучи та побуту Середный Наддніпрянщини), which was founded in 1964 and presents 185

[58] KULIŠŤÁKOVÁ, Veronika. *Samoobslužná edukace v muzeích v přírodě: návrh řešení pro Valašské muzeum v přírodě v Rožnově pod Radhoštěm.* Magisterská diplomová práce. Brno: Masarykova univerzita, 2024, p. 46.

[59] Ibidem, p. 47.

[60] https://museum-portal.com/en/museums/142_national-museum-of-folk-architecture-and-life-of-ukraine [accessed, 14.3.2024].

[61] https://lvivskansen.org/pro-muzej/about-us/ [accessed, 1.6.2024].

objects coming primarily from the 18th and 19th centuries. The main emphasis here is placed on peasant life in the lands of the middle Dnipro. It presents primarily settlements in villages, which are grouped based on the nature of their activity: the home of a priest, a potter, a cooper, a tinker, a healer, etc., and also based on their social status: the estates of a yeoman, a widow, a wealthy industrialist.

Fig.17: *House of a wealthy Cossack from the village of Volyunivka in the Poltava Region (19th century) (Ukraine).* Photo by Yulia Ivashko, 2021.

The museum in Pirohiv (National Museum of Folk in Pirohiv, Нацульно музей народной архитекутичи та побуту України), located on the outskirts of Kyiv, presents the uniqueness of all the ethnographic regions of Ukraine – Polesia, Middle Dnipro, Podolia, Poltava, Sloboda, Carpathians, the South, with separate expositions of windmills and Ukrainian villages from the 1960s and 1970s.[62] The museum in Pereiaslav presents peasant farmsteads and wooden churches as well as windmills of the Middle Dnipro region.

Of interest is the emergence in recent years of new open-air museums in Ukraine, referred to as a "skanzen-type architectural complex". These differ from the original, classic ethnographic open-air museums by presenting accurate reproductions of authentic examples of folk architecture and everyday life.[63] This is how, for example, the Cultural-educational complex

[62] KASHCHENKO, Tetyana; AKHAIMOVA, Anastasiia; HOMON, Olha; CIEPLUCHA, Wojciech. Synthesis of landscape and architecture as a means of expressing national identity. In: *Landscape Architecture and Art*, vol. 19, 2021, No. 19, pp. 31–42.

[63] БОРИСЕНКО, Юлія Станіславівна. [BORYSENKO, Julia Stanislavivna] Культурно-дозвіллєва діяльність архітектурних комплексів скансенівського типу в Україні на початку ххіст. [Cultural and leisure activities of architectural complexes of scanseniv type in Ukraine at the beginning of the 21st century]. In: *Культура і мистецтво у сучасному світі*, vol. 20, 2019, p. 39. (pp. 30-43.) [ukrainian].

"Mamayeva Sloboda" (Kyiv 2009)[64] or "The Kievan Rus Park" (Kopachiv village)[65] and others originated.

Conclusions

We can define open-air museums as a special type of museum, as a museum exposition that usually consists of original authentic architectural objects together with interior elements, located in an environment that is as close as possible to the original, i.e., an authentic environment. Jiří Langer, a leading theorists, branded open-air museums as professional institutions that preserve and interpret folk culture on a scientific basis in the form of a special museum exhibition.[66] The foundation of an open-air museum is the effort to reconstruct the original historical environment and the original natural bonds of the architectural object to that environment. An open-air museum creates complex scientific interpretations of the life and culture of the population in a defined area in the form of a specialised exposition in an urban environment or in nature. A specialised exhibition presenting a model reconstruction at the same time contains not only spatial, temporal and social contexts, but also natural settings and historical interpretations and contexts, with the aim of achieving the most accurate reconstruction possible of the original historical environment,[67] the settlement landscape. The exhibition combines exterior and interior elements, which are comprised of buildings (sets of buildings) and collection items, but also the terrain and biological elements.[68] This definition of open-air museums also reflects the valid definition of the AEOM, and open-air museums in Central Europe (Czech Republic, Poland, Slovakia and Hungary) operate on these professional principles.[69] According to the AEOM statutes, open-air museums are defined as "*scientific collections in the open air of various types of structures, which as constructional and functional entities, illustrate settlement patterns, dwellings, economy and technology*".[70]

Specifically, the term "skanzen" can be used in some countries to refer to open-air museums, following the example of Sweden's first ever open-air museum. This term appeared and still occurs from time to time not only in the Czech and Slovak, but particularly in Hungarian and Polish environments, where it is fully accepted by the academic community and equivalent to the term "open-air museum".[71] This term can also be seen in Eastern Europe, for example, in Ukraine. In Western and Northern Europe, different terms are also used to describe this type of museum. These designations are based mainly on the focus and nature of the exposition itself, such as *agricultural museum*, *folk museum*, *living history*, *heritage village*, *museum village*, *living farm*, or even *eco-museum* or *archaeological park*.[72] From the mentioned terms, let us stop for a

[64] https://mamayeva-sloboda.kyiv.ua/en/about-us/ [accessed, 30.6.2024].
[65] https://parkkyivrus.com/ua/ [accessed, 30.6.2024].
[66] LANGER, Jiří. Muzeum v přírodě jako forma tezaurace památek lidového stavitelství. In: *Národopisné aktuality*, vol. XIII, 1976, No. 3, p. 179; also see DRÁPALA, Daniel. Definicie muzea..., p. 20.
[67] BRYOL, Radek. Vymezení metodických zásad..., p. 31, 34; MICHALIČKA, Václav. Múzea v přírodě – specifika kulturně-paměťového konstruktu. In: KUMINKOVÁ, Eva (ed.). *Muzea v přírodě : Jedinečná cesta muzejnictví*. Rožnov pod Radhoštěm: Národní muzeum v přírodě, 2019, p. 56.
[68] *Muzea v přírodě v České republice: Teoretická a metodická východiska*. Rožnov pod Radhoštěm: Národní muzeum v přírodě, 2020, p. 29.
[69] BRYOL, Radek. Vymezení metodických zásad..., pp. 32–33.
[70] https://theaeom.org/wp-content/uploads/2024/10/2024_Statutes-of-the-Association-of-European-Open-Air--Museums.pdf [accessed, 31.10.2024].
[71] DRÁPALA, Daniel. Definicie muzea..., p. 17; Muzea v přírodě v České republice..., p. 23.
[72] OLINSSON, Sascha Bjarnø. A Museology..., p. 5.

moment at the concept of an eco-museum, which is truly very close to the concept of an open-air museum.[73] The common features of both types of museums are their living history; the integration of common people into history; the creation of a national, regional and local identity, a regional context or local culture, and reconstruction of the original environment. The connection between an eco-museum and the concept of an open-air museum can also be seen in the field of environmental education.[74]

An open-air museum as living history, a living farm, or directly a living museum indicates one of the typical characteristics of museum presentations in these institutions. To enliven the presentation, not only models in period clothes and arranged doing specific activities are more often used, but the role of a guide who can, for example, perform demonstrations directly, is also important.[75] Without a doubt, an authentic demonstration by a direct bearer of a living tradition of the most diverse fields of human activity has a greater impact on the visitor. The relationship between the visitor and the open-air museum cannot be formulated only from the position of visual experience and passive obtaining of knowledge about the way of life or the use of buildings and their equipment. The modern approach of the "living museum" is expressed mainly through specialised presentations and activation and educational programmes for visitors, which are often focused on traditional demonstrations of handicraft technologies, folk art creation with the direct active involvement of the visitor,[76] but also with manifestations of folklorism or an encounter with an experiment, which can often be seen in the museums of Central Europe. From this it is clear that open-air museums also fulfil a educational function, and visitors not only gain new information in them, but also an experience and an active form of relaxation.

With some exceptions, open-air museums in Central and Eastern were generally established 50–60 years later than in Northern and Western Europe. Ethnographically oriented open-air museums largely predominate in this environment, but there are also numerous technological museums (e.g., specialised mining museums in the Czech Republic). Modern and innovative trends are used in their presentation activities, focusing more significantly on the interactivity of the visitor. A common part of the approach of such museums is the accessibility of open-air museums for visitors with special needs, but also the use of modern technologies (e.g., QR codes with expanding information).

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[73] NAVAJAS CORRAL, Oscar. Ecomuseums in Spain: an analysis of their characteristics and typologies. In: *Muzeológia a kultúrne dedičstvo*, vol. 7, 2019, Is. 1, pp. 7–26, https://muzeologia.sk/index_htm_files/mkd_1_19_O_N_Corral.pdf; MAGLIACANI, Michela. *Managing Cultural Heritage: Ecomusuem, Community Governance and Social Accountability*. Palgrave Pivot 2015, pp. 48-60; GÖZ, Seda; GÜNERÖZ, Ceren. Power of Museums: Ecomusuems for Sustainable Environment, Development and Diversity. In: *Milli Folklor*, 2023, Is. 139, pp. 5–17, DOI: https://doi.org/10.58242/millifolklor.1066485; ZAPLETAL, Miloš; MURIN, Ivan. Úloha ekomuzea v ochraně přírodního dědictví. In: KUMINKOVÁ, Eva (ed.). *Muzea v přírodě : Jedinečná cesta muzejnictví*. Rožnov pod Radhoštěm: Národní muzeum v přírodě, 2019, p. 45; BRYCH, Mariia. General approaches to spatial formation of open-air museums exhibition. In: *Space & Form*, 2020, No. 43, p. 115, DOI: https://doi.org/10.21005/pif.2020.43.C-01.

[74] ZAPLETAL, Miloš; MURIN, Ivan. Úloha ekomuzea..., p. 45.

[75] ŠIMŠA, Martin. Model prezentace, prezentace jako objekt teorie. In: KUMINKOVÁ, Eva (ed.). *Muzea v přírodě : Jedinečná cesta muzejnictví*. Rožnov pod Radhoštěm: Národní muzeum v přírodě, 2019, pp. 132–135.

[76] OLINSSON, Sascha Bjarnø. A Museology..., pp. 8–9.

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The Starmach Gallery in Kraków: The Gallery of Contemporary Art in a Former Jewish House of Prayer

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The Starmach Gallery in Kraków: The Gallery of Contemporary Art in a Former Jewish House of Prayer
The adaptation of the former Jewish Zucker House of Prayer as a gallery of contemporary art is a unique phenomenon due to both the complicated history of the heritage building itself and the unique personality of the current owner. Andrzej Starmach, an art dealer and collector in one, has gathered an extraordinary collection of contemporary Polish art, managing to stay ahead of popular trends. For many years, the Starmach Gallery was a lone beacon of culture in the run-down Podgórze district, which is now flourishing, becoming a location of numerous museums. Through their recent donation of their outstanding collection of Polish contemporary art – built up over a period of many years – to the city of Kraków, Andrzej and Teresa Starmach have left their mark on the history of Polish art collecting.

Keywords: Polish contemporary art, collecting, heritage, memory, adaptive reuse.

The collector and his gallery

In her book *The Private Museum of the Future*, Dora Imhof compared large public museums to cruisers, steadfastly headed in a predetermined direction under the watchful eye of politicians, supervisory boards and steering committees. They stand in contrast to private collectors, bustling around like agile motorboats, their actions swift, ideas unpredictable and concepts radical. Private collectors explore uncharted roads and go against popular tastes and widely held notions.[1] They take risks because only time will show whether their achievements are appreciated or not.

One example of such a collector, independent and always doing things his own way, is Andrzej Starmach (b. 1953), an art historian and art dealer who has been running the Starmach

[1] IMHOF, Dora. Introduction. In: BECHTER, C; IMHOF, D. (eds.). *The Private Museum of the Future*, JRP/Ringier, Zurich, 2018. p. 15.

Gallery in Kraków together with his wife, Teresa, since 1989.[2] Thanks to his efforts, at the beginning of the twenty-first century, works by Jerzy Nowosielski, a painter still alive at the time, became some of the most sought-after and highly regarded Polish paintings. It was also thanks to Starmach that a monograph on Nowosielski was published by the prestigious publishing house Skira.[3] Previously, in the 1990s, canvases by the long-deceased painters Jacek Malczewski, Wlastimil Hofman and Jerzy Kossak[4] fetched the highest prices on the Polish market. Nowosielski's market success led to a breakthrough and paved the way for other classics of Polish post-war art: works by Wojciech Fangor, Stefan Gierowski, Jan Lebenstein and eventually those by much younger artists began to show up at auctions. Władysław Hasior was another artist whose work was brought back from oblivion and, in a sense, popularised by Andrzej Starmach. Starmach exhibited Władysław Hasior's works for the first time at the Art Basel International Art Fair in 2013. Art dealers and critics from across the world were amazed that as early as the 1960s Poland had such an original artist, on a par with world-famous geniuses of art. In order to offer and popularise Hasior's works across the world, Starmach first needed to collect them. He purchased them at good prices, especially in Scandinavia, where the artist had exhibited several times in the 1960's.[5] It was in Scandinavia that Starmach's passion for collecting art began. As a student, he worked first in Finland and then in Sweden, purchasing paintings with the dollars he earned. For example, a very good painting by Nowosielski, 70 cm x 50 cm, was purchased for a mere 20 dollars(!). Unfortunately, this painting had to be sold in 1996, when Starmach was building his gallery in the Podgórze district.[6]

Starmach states that he identifies primarily as a collector:

> In the history of world art collecting, a recurring motif is that art dealers create their private collections. For example, the Beyeler Foundation Museum near Basel grew out of an art dealer's private collection. If an art dealer is serious about their work, they cannot treat art merely as a commodity. If you do not love art, do not wish to own works of art for yourself, you cannot seriously pursue this profession.[7]

Alongside running a commercial gallery, Andrzej and Teresa Starmach created a private collection of Polish avant-garde art from the post-Second World War era. The profile of this collection, however, differed slightly from the profile of the gallery's activities. In the gallery's early years, the exhibitions featured Kraków-based artists from several different generations, including Marek Chlanda, Wojciech Ćwiertniewicz, Tadeusz Kantor, Kazimierz Mikulski, Jerzy Nowosielski, Andrzej Pawłowski, Maria Pinińska-Bereś, Teresa Rudowicz, Maria Stangret, Jacek Maria Stokłosa, Andrzej Szewczyk, Teresa Tyszkiewicz, Andrzej Wełmiński and others. Meanwhile, their collecting tastes, besides a fascination with Jerzy Nowosielski's paintings,

[2] STARMACH, Andrzej, MILISZKIEWICZ, Janusz. Jak być bogatym? In: *Satander Art and Culture Review* 1(2), 2016, p. 9.

[3] SZCZEPANIAK, Andrzej (ed.). *Jerzy Nowosielski*. Milano: Skira. ISBN 978-8857241531. Kraków: Galeria Starmach, 2019.

[4] MILISZKIEWICZ, Janusz. Sztuka w blasku pieniędzy. In: *MOCAK Forum* 1/2013 (6), 2013.

[5] MILISZKIEWICZ, Janusz, TORAŃSKI, Błażej. *Obrazy ze świata fikcji*. In: *WP Finanse*, 2015.

[6] STARMACH, Andrzej. Warto przepłacać za najlepsze obrazy. In: *RZECZPOSPOLITA* 19.11.2009.

[7] STARMACH, Warto przepłacać…. NB: while talking with authors of this article he admitted that in his opinion Beyeler Foundation is the most beautiful museum in the world (talk with A. Starmach in his gallery, Kraków, 29 October 2024)

Fig. 1: *Andrzej Starmach in his gallery, above Tadeusz Kantor's painting "Les Enveloppes" (1966)*, photograph by Artur Jasiński.

revolved around the constructivist abstraction pursued by Warsaw-based painters connected with the Foksal Gallery. This group included Henryk Stażewski, Edward Krasiński, Koji Kamoi and Henryk Winiarski. Over time, the works of Warsaw artists were balanced by the addition of pieces by Kraków artists, primarily members of the so-called Kraków Group, including Tadeusz Kantor, Andrzej Pawłowski, Maria Stangret, Jadwiga Maziarska, Tadeusz Brzozowski and Jonasz Stern.[8] The dialogue between these two artistic circles – constructivist abstraction

[8] ROTTENBERG, Anda. In One's Own Footsteps. In: SZCZEPANIAK, A. (ed.) *kolekcja. dwadzieścia lat galerii starmach*. Kraków: Muzeum Narodowe w Krakowie 2009, pp. 25-29.

and geometric abstraction – defined the main axes around which an impressive and likely the finest collection of Polish contemporary art was created.

The Starmach collection has been publicly displayed several times. Two major survey exhibitions showcased at the Starmach Gallery resonated widely – the *First Exhibition of Modern Art. Fifty Years Later* in 1998 and *Modernists and Socialist Realism* in 2000. In 2009, the exhibition *A Collection: Twenty Years of the Starmach Gallery* was presented at the National Museum in Kraków, featuring 363 works from the Starmach collection. This significant and widely debated exhibition, accompanied by a four-volume catalogue,[9] provoked a discussion about the relationship between private collectors and public museums. There were accusations that the presentation of a private collection at the National Museum enhances the market value of the exhibited works due to its reputation. Concerns were raised about why the museum did not agree with the collector that the works displayed at the National Museum would not return to the market. Interestingly, previous exhibitions of private collections did not provoke such controversies, such as those of Rafał Jabłonka and Krzysztof Musiał, despite both of them being art dealers who run their own galleries and both exhibitions being shown in public museums. This narrative illustrates the sensitivity surrounding the overlap between the private and public spheres, especially when substantial financial resources are at stake.[10]

The Starmach Gallery has played, and continues to play, a crucial role on the artistic map of Poland by hosting exhibitions of both leading Polish and international artists, including notable figures such as Nobuyoshi Araki, Joseph Beuys, Louise Bourgeois, Andy Warhol, Sherrie Levine, Alberto Giacometti, Greg Bogin, Henrik Spohler and Nicolas Grospierre. Besides organising exhibitions held at its venue, the Starmach Gallery has also hosted exhibitions in other cities, promoting Polish contemporary art both within Poland and beyond its borders, including in Stockholm, London, Paris, Vienna, New York, Rome and Budapest.[11]

From 1989 to 2024, the Starmach Gallery organised over 150 exhibitions within the walls of its venues, primarily featuring solo exhibitions of painters, sculptors, graphic artists, illustrators and photographers. Works by Nowosielski – as well as those by Abakanowicz, Chlanda, Kałucki, Kantor, Lutyński, Stangret and Tarasin – have been exhibited numerous times. It is important to highlight that every exhibition was accompanied by a catalogue, which at times was quite substantial in size. For instance, on the occasion of the retrospective exhibition of Jerzy Nowosielski at the Zachęta Gallery in Warsaw, the Starmach Gallery and the Nowosielski Foundation published a catalogue consisting of 731 pages, featuring 750 works by the artist.[12] The crowning achievement of the Starmach Gallery's publishing activities was the release by Skira of the first English-language monographs on contemporary Polish artists: Henryk Stażewski in 2018[13] and Jerzy Nowosielski in 2019.[14]

Initially, the Starmach Gallery was housed in the mediaeval basement of a tenement building at ul. Rynek Główny 45 in Kraków. On 17 May 1997, the gallery opened in a new location in Kraków's Podgórze district, at 5 Węgierska Street, in the former Zucker House of Prayer,

[9] SZCZEPANIAK, Andrzej, (ed.). *kolekcja. dwadzieścia lat galerii starmach.* Kraków: Muzeum Narodowe w Krakowie 2009.

[10] JAGODZIŃSKA, Katarzyna. *Czas muzeów w Europie Środkowej. Muzea i centra sztuki współczesnej (1989–2014)*. Kraków: Międzynarodowe Centrum Kultury, 2014, pp. 274–275.

[11] SZCZEPANIAK, Andrzej. *Starmach Gallery. Profile and history,* http://www.starmach.eu/app/pl/about

[12] STARMACH, Andrzej (ed.). *Jerzy Nowosielski.* Kraków: Galeria Starmach, Fundacja Nowosielskich, 2003.

[13] SZCZEPANIAK, Andrzej (ed.). *Henryk Stażewski.* Milano: Skira. Kraków: Galeria Starmach, 2018.

[14] SZCZEPANIAK, Andrzej (ed.). *Jerzy Nowosielski.* Milano: Skira. Kraków: Galeria Starmach, 2019.

built in 1879–1881, where it continues today. The building at 5 Węgierska Street also houses the Nowosielski Foundation, established in May 1996 on the initiative of Zofia and Jerzy Nowosielski. The aims of this institution are to support and promote phenomena of great value in contemporary culture, both Polish and global; to support the achievements of artists from different generations and different fields; and to document Jerzy Nowosielski's works and conduct research on his work.[15]

The Starmachs' decision to move their gallery from the Main Square to the then run-down and remote Podgórze district seemed very bold, irrational even. The location on the famous A-B Main Square line, the main tourist route and promenade of Kraków's bohemia, was abandoned for a quiet little street on the outskirts of the city. Starmach says that the decision was directly inspired by a trip to the United States together with his wife in 1992.[16] While there, they visited many famous New York galleries of contemporary art. Such galleries are frequently located in adapted post-industrial buildings or garages in SoHo and Chelsea districts, changing their image and bringing about cultural, social and spatial transformations.[17] Artists, followed closely by art dealers (gallerists), are usually at the forefront of gentrification processes, a phenomenon not limited to New York. They make such districts "cool" while simultaneously precipitating further changes and transformations which can be seen in different ways: some are positive – the districts are revitalised; others can be seen as negative – residents are replaced and these places, as Sharon Zukin puts it, "lose their soul".[18] One of such rediscovered district is Kraków's Podgórze, forgotten several decades ago but now fashionable and vibrant. Podgórze Museum, which opened in 2018, traces the history of this district.[19]

The history of the Zucker House of Prayer

The World Jewish Restitution Organisation estimates that before World War II, there were over 3,300,000 Jews,[20] 966 synagogues and 766 houses of prayer in Poland.[21] The name "house of prayer" was conventional in a sense as it could refer both to a separate building used for studying, teaching and interpreting the Torah and to rooms designated for these purposes by a synagogue, *cheder* or *yeshiva*. Houses of prayer also served other functions: besides providing religious and moral instruction, they also served as places where the local community held meetings, handouts were given to the poor, books were collected and Hebrew was taught. They were established on the initiative of religious associations and private individuals. Sometimes they were grand buildings, rivalling synagogues in terms of size, quality of architecture and richness of furnishings. Like synagogues, they traditionally featured separate halls for men and for women, as well as a Torah ark (*aron ha-kodesh*) and a bimah. In Poland, a Jewish house of prayer was also called a *bet ha-midrash*, a *minyan* and a *bożniczka*.[22]

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[15] http://www.starmach.eu/app/pl/foundation

[16] STARMACH, Andrzej, MILISZKIEWICZ, Janusz. Jak być bogatym… 2016, p. 11.

[17] HALLE, David, TISSO, Elizabeth. *New York's New Edge: Contemporary Art, the High Line, and Urban Megaprojects on the Far West Side*. Chicago: University of Chicago Press, 2016.

[18] ZUKIN, Sharon. *Naked City. The Death and Life of Authentic Urban Places*. New York: Oxford University Press, 2010. pp. 35–61.

[19] https://muzeumkrakowa.pl/oddzialy/projekt-muzeum-podgorza

[20] https://wjro.org.il/our-work/restitution-by-country/poland/

[21] MOJKOWSKI, Jacek, TURSKI, Mieczysław. Mienie żydowskie. Majątek z popiołów. In: *POLITYKA* 6 (2075), 1997, p. 4.

[22] GRZESIAK, Krystyna. Co wiemy o żydowskich domach modlitwy na przykładzie Krakowa. In: *Krakowskie Studia Małopolskie*, 4/2000, pp. 26–27.

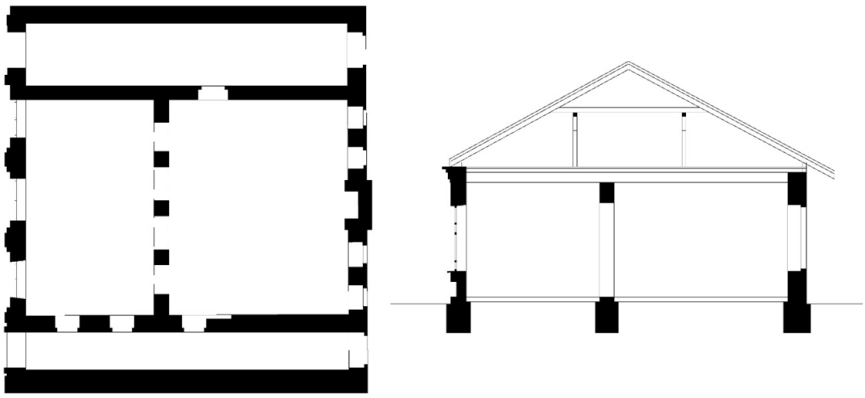

Fig. 2: *An original design of a Jewish house of prayer in Podgórze*, author: Jan Ertel (1881), own work on the basis of archival documents reproduced in Karski 2023, p. 52.

Fig. 3: *The former Zucker House of Prayer, currently housing the Starmach Gallery*, photograph by Artur Jasiński.

The Zucker House of Prayer, also called *Bet ha-Midrash Chasidim* (Hebrew for House of Study of the Hasidim), was built in 1879–1881 on the initiative of Dawid Zucker for the Bet ha-Midrash Chasidim Society for Prayer and Support. It belonged to the Israeli Religious Community in Podgórze. It is a red brick building in the Neoclassical style, drawing influence from Romanesque architecture. The brick facade is an excellent example of the round-arch style (*Rundbogenstil*) of architecture of Kraków. The facade from the Węgierska Street side

(from the west) is symmetrical and has three gables, a taller one in the middle and two smaller ones on either side, adorned with pediments with round windows. The entire facade is crowned with an arcaded frieze and a rich cornice of hand-moulded bricks. The building was entered into the register of monuments on 30 January 1996, under number A-1015, as a "former house of prayer".[23]

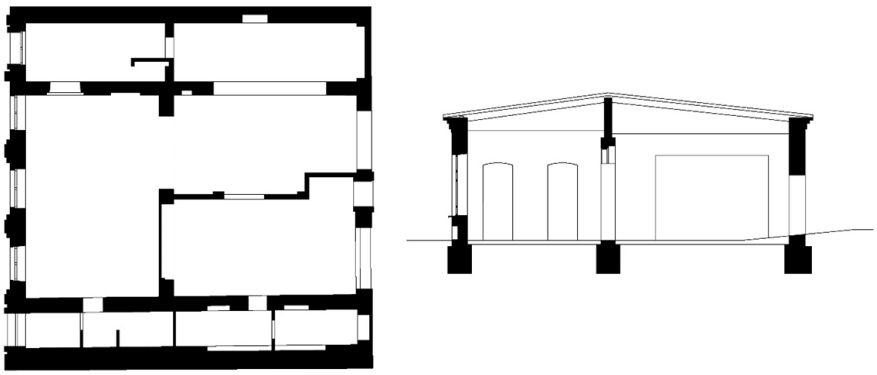

Fig. 4: *The layout of the building in 1995, own work on the basis of: "Survey of a Post-industrial Building"*, Kraków, Węgierska 5, 1995, author: architect Jacek Stawiarski.

The first mention of this building dates back to 1876, when an application for a building permit was submitted to the City Hall of the Royal Capital City of Kraków. The design was prepared by the architect Jan Ertel and the building plans bear his signature.[24] It was a single-storey building, built on a rectangular plan. Its central bay featured halls for men and for women, with two corridors on the sides serving as walkways. The left corridor led to the men's hall, while a slightly narrower right corridor led to the women's hall. The two halls were separated by a wall with four characteristic semicircular arcades, parallel to the facade. A recess for a Torah ark lay on the centre line of the building on the eastern wall, as tradition dictates, while a bimah stood at the centre of the men's hall. The building had wooden beamed ceilings, probably richly decorated, and a gable roof.[25] The hallways led to the courtyard of the property. On its opposite end were facility areas, which in 1909 were extended and adapted into the caretaker's lodgings and a kosher kitchen used for baking matzos.[26]

The Zucker House of Prayer was the largest house of prayer in Podgórze and, as such, became the scene of important events. A meeting of Zionists attended by Ozjasz Thon was held there in 1919, elections to the Jewish Community Council in Podgórze took place there, and in the 1930s a tzadik from Bobowa visited the house of prayer while leading a procession of the faithful.[27] In 1941–1943, the Germans closed down all Jewish religious and social

[23] https://sztetl.org.pl/pl/node/86089

[24] KARSKI, Kamil. Żydowskie domy modlitwy, łaźnia oraz cmentarze w Podgórzu. In: FIGIELA, P. (ed.). *Zanim wyrosły mury. Żydzi w Podgórzu*. Kraków: Muzeum Krakowa 2023, p. 54.

[25] GRZESIAK, Co wiemy o żydowskich…, p. 32.

[26] TRAUTSOLT, Krystyna. Telewizyjny teatr Studio w Krakowie. *Architektura* 2/1989, p.37.

[27] KARSKI, Żydowskie domy modlitwy..., pp. 54–55.

organisations and confiscated their property. A devastated Zucker House of Prayer served as a storehouse for items taken from Kraków's synagogues.[28]

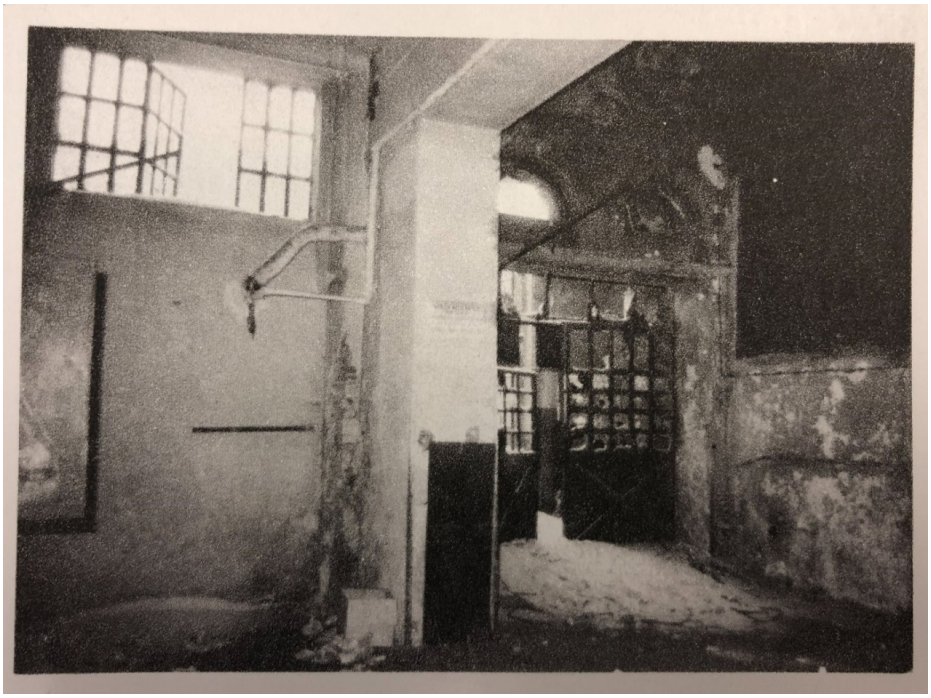

Fig. 5: *The devastated interior of the Zucker House of Prayer, 1986*, photograph taken from Architektura 2/1989, p. 37.

After World War II, Jewish religious buildings, including houses of prayer, ceased to serve their original functions. Some of them were demolished, others rebuilt. As abandoned property, they were handed over to new owners, who adapted them to their needs. Many of them were handed over to production cooperatives. Adaptive reuse projects rarely took into account the buildings' original function or their historical or artistic value.[29] Improper use and the lack of supervision by a conservator further contributed to their destruction.[30] Such was the fate of the Zucker House of Prayer. From 1945, it was used by the "Trud" Cooperative of Deaf-Mute Disabled People. The building was rebuilt: the wall with the arcades was partially taken down and the wall between the main hall and the corridor was demolished. The resulting space was divided into smaller rooms with partition walls. Large holes were made in the eastern wall, and another hole was made in the recess for an altar cabinet, where the Torah ark used to stand. Window and door frames were replaced and the roof covering was changed. Over the years, the building that had once been a house of prayer, then a production facility, fell into complete disrepair. Only its brick facade survived in relatively good condition.[31]

[28] https://sztetl.org.pl/pl/node/86089

[29] WILCZYK, Wojciech. *Niewinne oko nie istnieje*. Łódź-Kraków: Atlas Sztuki i Korporacja ha!art, 2009.

[30] GRZESIAK, Co wiemy o żydowskich…, p. 27.

[31] Ibidem, p. 33.

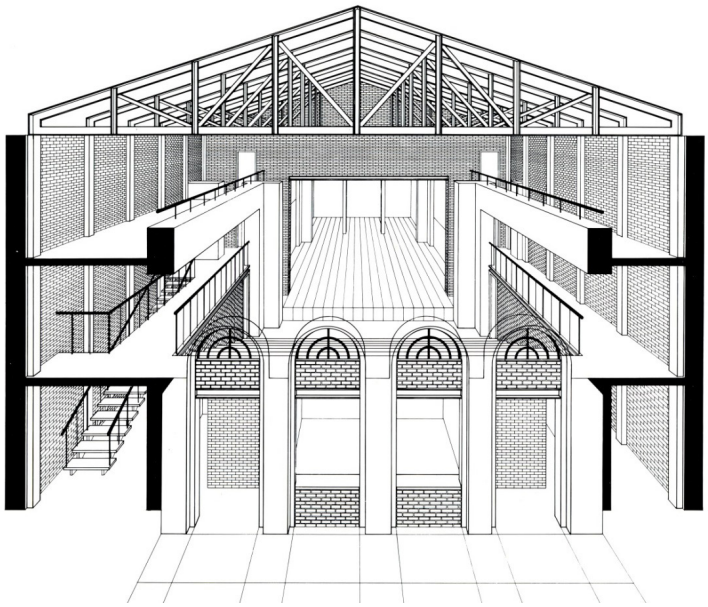

Fig. 6: *Project to adapt the former Zucker House of Prayer as the Studio Television Playhouse, 1986, axonometric view*, from Artur Jasiński's archives.

In 1986, after the "Trud" Cooperative had left the building, its adaptive reuse as the Studio Television Playhouse was proposed. The building was meant to become a studio for recording plays for Kraków Television.[32] This idea originated with the editor Krzysztof Miklaszewski. One of the authors of this article (Artur Jasiński) had a chance to participate both in compiling surveys and inventories[33] and designing the playhouse.[34] At the time, the building seemed more like a completely devastated post-industrial relic than a religious building of historical interest. Most people at that time had no idea that Jews had been part of the history of Podgórze.[35] The "Jewish space" in Poland was practically non-existent, having disappeared with the Holocaust.[36] It was only through archival research that we realised we were dealing with a Jewish house of prayer, prompting us to incorporate design features and details inspired by the original function of the building into the design. For example, the original layout of the rooms was restored and the motif of a seven-branched candelabrum was used on the arcades separating the theatre room from the foyer. A curtain reproducing a drawing of the altar wall with a Torah ark where it once used to stand was meant to be an element directly inspired by the religious heritage of this building. This concept directly reflected the idea that a narrative method could be used when adapting former places of worship for secular functions, which emerged many

[32] TRAUTSOLT, Telewizyjny teatr …. pp. 35-43.

[33] Archiwum Urzędu Miasta Krakowa, sygn.. BA. B99.P-1/849. *Inwentaryzacja architektoniczno-budowlana dla potrzeb adaptacji budynku bożnicy im. Zuckera na teatr,* Kraków 1986, msp, t. 1–7.

[34] Architects: Stanisław Deńko (team leader), Jacek Czech, Artur Jasiński, Robert Kuzianik.

[35] SROKA, Łukasz, T. *Między Klasnem a Krakowem. Historia Żydowskiej Gminy Wyznaniowej w Podgórzu.* In: FIGIELA, P. (ed.). *Zanim wyrosły mury. Żydzi w Podgórzu.* Kraków: Muzeum Krakowa, 2023, p 41.

[36] LEHLER, Erica T., MENG, Michael. *Jewish Space in Contemporary Poland.* Bloomington: Indiana University Press 2015, p. 1.

years later.[37] The former Zucker House of Prayer was never turned into the Studio Television Playhouse. It was only 10 years later, in 1996, that the Starmach Gallery opened there, after extensive renovations.

Adaptation of the House of Prayer as the Starmach Gallery

The design for adapting the former Zucker House of Prayer as a gallery of contemporary art was prepared by Kraków architect Jan Rumian, while Professor Piotr Krakowski, a historian of art, was responsible for the conservator's supervision.[38] The construction work was carried out by Sigma construction company.[39] The usable area of the building after adaptation was approximately 580 m^2.

Fig. 7: *The devastated interior of the House of Prayer, the men's hall in the foreground, the women's hall on the left, 1995*, photograph by Marek Gardulski, Starmach Gallery's archives.

The front elevation was painstakingly repaired, new doors and windows were installed, and the interior was designed in minimalist style: white walls, steel roof structures painted black and dark, and concrete floors. The original division into the women's hall, the men's hall and two side corridors was not retained. A new transverse wall was erected, sectioning off part of the former men's hall to create a high and long warehouse along the eastern wall. Unfortunately, this new partition wall changed the original proportions of the interior and covered the altar recess, which is now hidden in the warehouse and inaccessible to the public. The only relic preserving the original character of the interior is four pillars with semicircular arcades. An additional bay, housing a small exhibition room and an office space, was added from the side

[37] WIERZBICKA, Anna Maria, ARNO, Maria. Adaptation of places of worship to secular functions with the use of narrative method as a tool to preserve religious heritage. In: *Museológia a kultúrne dedičtvo*, vol. 10, 2022, Is. 4, pp. 63–67.DOI: https://doi.org/10.46284/mkd.2021.10.4.5

[38] http://www.starmach.eu/app/pl/about

[39] https://www.sigma-aib.com.pl/ofirmie.html

of the courtyard, while office, storage and welfare facilities were created at the far end of the courtyard, in a side annexe. The architecture is sparse, creating a "white box" atmosphere, typical of modern museum interiors, which makes it possible to exhibit various types of art. There are no direct references to the previous, religious function of the building inside it. This quite popular and safe strategy for the adaptive reuse of historic buildings can be defined as functional adaptive reuse[40] or, following the typology proposed by Pieczka and Wowrzeczka, preservative strategy with interventions in interiors.[41]

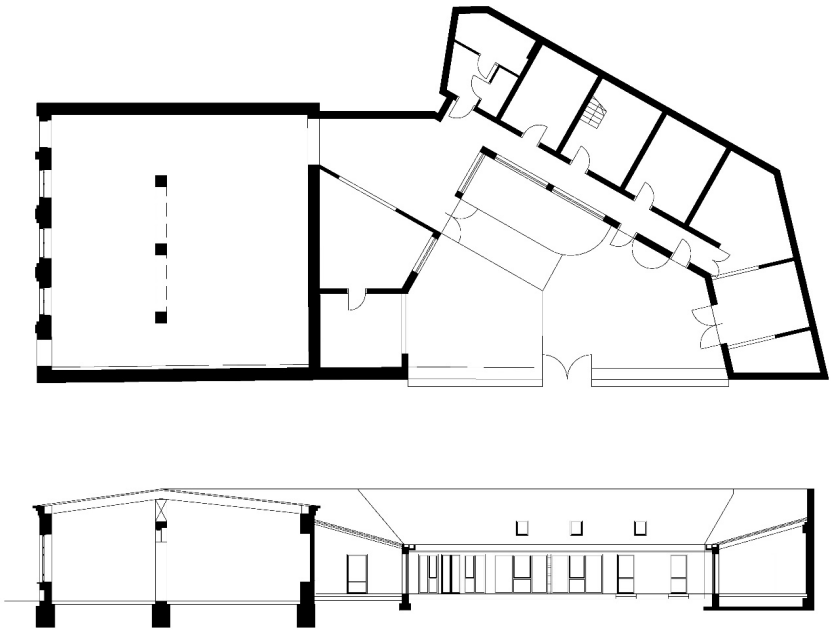

Fig. 8: *The design for the adaptive reuse of the former house of prayer as an art gallery, own work on the basis of a technical design*, author: Jan Rumian, June 1996.

Fig. 9: *The main hall of the Starmach Gallery,* photograph by Artur Jasiński.

[40] ROBERT, Phillipe. *Adaptations. New Uses for Old Buildings*. Princeton: Princeton Architectural Press, 1991.
[41] PIECZKA, Michał, WOWRZECZKA, Bogusław. Art in Post-Industrial Facilities – Strategies of Adaptive Reuse for Art Exhibition Function in Poland, In: *Buildings* 11(10), p. 10.

Fig. 10: *The Starmach Gallery, an interior detail: the former arcaded wall separating the men's hall and the women's hall* (*ezrat nashim*), photograph by Artur Jasiński.

What distinguishes this design from many other galleries of contemporary art in adapted historic buildings is its original religious function. Analyses and research show that post-industrial buildings are most often adapted into exhibition and gallery spaces in Poland.[42] This is due to two factors: an abundance of post-industrial buildings which appeared in Poland in the wake of the political transformation and economic changes after 1989, and the growing needs of the burgeoning cultural sector, in particular the public sector. Such icons of contemporary architecture as MOCAK Museum of Contemporary Art in Kraków (2010), the Tadeusz Kantor Museum (2014) or the Silesian Museum (2015) were established in adapted post-industrial buildings. There is wide public approval for these developments: they are seen as efforts to preserve and protect cultural heritage and are appreciated for their environmentally friendly nature, consistent with the "reduce, reuse, and recycle" principle inherent in sustainable development policies.[43] The use of religious buildings for non-religious purposes is another story, especially in Poland. Although museums created in buildings that previously served religious functions make up nearly 7% of all national museums in Poland,[44] they are primarily religious, historical or regional in nature. Andrzej Białkiewicz notes that the preservation of religious heritage is a problem as these buildings "retain an aura of worship that is very intense and significant in Poland.… [I]t should be stressed that in Poland, the intangible value of a

[42] PIECZKA, WOWRZECZKA, Art in Post-Industrial Facilities…, p.1.
[43] PLEVOTELS, Bie, CLEEMPOEL Van, Koenraad. *Adaptive Reuse of the Built Heritage. Concepts and Cases of an Emerging Discipline*. London-New York: Routledge 2019; WONG, Liliane. *Adaptive Reuse. Extending the Lives of Buildings*. Basel: Birkhäuser 2017; WONG, Liliane. *Adaptive Reuse in Architecture. A Typological Index*. Basel: Birkhäuser, 2023.
[44] RUSNAK Marta. Adaptacja budynków sakralnych na cele muzealne w Polsce. Historia i skala zjawiska. In: *Architectus*, 2015, 3 (43), p. 86.

historic building and its former religious functions are much more respected than in other European countries.[45]

According to Białkiewicz, one example of the transformation of a religious building for other functions is the adaptive reuse of a former Bernardine monastery in Wrocław as the Museum of Architecture under the supervision of professor Edmund Małachowicz in 1956–1974.[46] Interestingly, Białkiewicz's research completely disregards Jewish religious buildings, synagogues and houses of prayer that were not destroyed during World War II and were later rebuilt and adapted for other purposes.

Podgórze district – restoring memory

Polish Jews were murdered during World War II and faded from memory for many years. Jewish cemeteries were left to overgrow; *matzevah* were sometimes used for building materials; Jewish property was plundered; and buildings, including religious ones, were demolished or rebuilt for other purposes. As communism fell and Central and Eastern Europe regained their freedom, the time came to restore the historical memory. This process was characteristic of the largest metropolises: Berlin, Budapest, Prague, Vilnius and Warsaw.[47] One of the most characteristic and dynamic places to witness this process was Kraków's Kazimierz district, in which as many as seven synagogues survived, even though the city's Jewish residents had been murdered. It became the scene of the Jewish Culture Festival, organised for the first time in 1988,[48] and was put on the map by Steven Spielberg's 1994 film *Schindler's List*. Spielberg decided to direct his film in Kazimierz rather than in Podgórze, where the Jewish ghetto was located, for logistical reasons: the panorama of Podgórze at the time was spoiled by newly erected buildings and a television tower in the Krzemionki Hills.[49] The film created a tourist boom and an increased interest in the fate of Kraków's Jews during World War II, which in turn contributed to the popularisation and commercialisation of Kazimierz. All this led Monika Murzyn-Kupisz to ask the important question of whether restoring Jewish memory and exploring heritage can be reconciled with consumption and mass tourism, as well as a pseudo-Jewish stylisation of historical space.[50]

Podgórze has successfully escaped the fate of the fashionable and crowded Kazimierz. Its location on the right bank of the Vistula River and suburban character protected this district against the first wave of gentrification. Things changed after the construction of the Bernatek Footbridge (2010), the Schindler Museum (official name: Oskar Schindler's Enamel Factory,

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[45] BIAŁKIEWICZ Andrzej. *O zmianach użytkowania obiektów sakralnych/ Adaptive Reuse of Sacred Buildings*. Kraków: Politechnika Krakowska 2016, p. 240.

[46] BIAŁKIEWICZ, *O zmianach…,* p. 244.

[47] PURCHLA Jacek. Świat po katastrofie – w poszukiwaniu utraconej pamięci. In: MURZYN-KUPISZ, M.; Purchla, J. (eds.). *Przywracanie pamięci. Rewitalizacja zabytkowych dzielnic żydowskich w miastach Europy Środkowej*. Kraków: Międzynarodowe Centrum Kultury, 2008, p. 7.

[48] MAKUCH Janusz. *Festiwal Kultury Żydowskiej: na pograniczu dwóch światów*. In: MURZYN-KUPISZ, M.; Purchla, J. (eds.). *Przywracanie pamięci. Rewitalizacja zabytkowych dzielnic żydowskich w miastach Europy Środkowej*. Kraków: Międzynarodowe Centrum Kultury 2008, p. 245.

[49] LEHLER Erica T. (2013). *Jewish Poland Revisited. Heritage Tourism in Unquiet Places*. Bloomington: Indiana University Press, 2013, p. 31.

[50] MURZYN-KUPISZ Monika, *Przywracanie pamięci czy masowa konsumpcja? Dylematy odkrywania żydowskiego dziedzictwa kulturowego krakowskiego Kazimierza*. In: MURZYN-KUPISZ, M.; Purchla, J. (eds.). *Przywracanie pamięci. Rewitalizacja zabytkowych dzielnic żydowskich w miastach Europy* Środkowej. Kraków: Międzynarodowe Centrum Kultury 2008, pp. 365–384.

a branch of the Kraków Museum) (2010), MOCAK Museum (2011), the Kantor Museum (2014) and the campus of the Andrzej Frycz Modrzewski Kraków University (2003–2008), accompanied by the construction of a large number of residential and commercial buildings in the Zabłocie area. This district has thus been given a new lease of life, while so far managing to avoid thematisation and theatralisation. It seems that the old historical elements – in particular those inspired by its Jewish history, such as the Schindler Museum, the Ghetto Heroes Square with a sculptural installation by the Lewicki-Łatak Design Studio, and the Trail of Remembrance created around the Podgórze Ghetto – are not eclipsing the contemporary feel of this new district. A range of clubs, restaurants and galleries are now fleeing crowded Kazimierz for Podgórze in search of creative space (and lower rental rates). From this perspective, Andrzej Starmach's decision to move the gallery from Kraków's market square to Podgórze, taken nearly 30 years ago, now seems prophetic. Jarosław Działek, who traces the history of the independent art market in Kraków, observes that Starmach's gallery, one of the leading private galleries in Poland, was like a lone cathedral in an artistic wasteland in Podgórze for an entire decade. It was only the second decade of the twenty-first century that brought changes: old Podgórze and post-industrial Zabłocie became the new "promised land" for Kraków's artists and art dealers, offering them cheaper run-down real estate and, just as importantly, a reference to their impoverished and peripheral industrial past. However, here, too, gentrification processes have already begun, with developers quickly developing and transforming these districts to meet the needs of an increasingly affluent middle class.[51]

Fig. 11: *A commemorative plaque on the Starmach Gallery*, photograph by Artur Jasiński.

[51] DZIAŁEK Jarosław. A Spatial History of Independent Art Spaces in Krakow from 1970s to 2019. In: *Arts* 10, 2021, pp. 15–17.

Conclusion

Lastly, it is time to address the recurring questions around whether adaptive reuse of former religious buildings for other functions is appropriate,[52] and whether dignity can be retained in the process of the secularisation of the sacred.[53] Researchers usually note that the adaptive reuse of religious buildings for new functions may be the only way to save them and preserve them for generations to come. Nevertheless, in practice, the adaptation of religious buildings is far more challenging than the adaptation of other historic buildings for other functions.[54] Their owners, conservators and designers are faced with a dilemma: how to transform them for other functions while preserving their symbolic value and retaining religious furnishings, such as altars, reliquaries, tabernacles or tombs.[55] Monika Murzyn-Kupisz mentions the Starmach Gallery, located in the renovated house of prayer on Węgierska Street in her analysis of dilemmas surrounding the exploration of Kraków's Jewish heritage. She concludes that Jewish material heritage can still serve utilitarian functions while retaining them, as is the case with numerous schools or the former Jewish hospital on Skawińska Street, today one of the clinics of the Jagiellonian University Medical College. Religious buildings can also be adapted for new functions, the best-known examples being the Starmach Gallery in the former Zucker House of Prayer and the Centre for Jewish Culture housed in a renovated and extended house of prayer on Plac Nowy.[56]

Fig. 12: *Mirosław Bałka's SEMPER FRAGMENTUM exhibition, drawings hung close together on the pillars and a graphic installation at the back, where the Torah ark used to stand*, photograph by Artur Jasiński.

Contemporary art is no stranger to controversial subjects. The Starmach Gallery has exhibited such bold works as photographs by Nobuyoshi Araki and perverse drawings by

[52] MIGALSKA Kinga. The Question of Appropriateness. Museums Established in Synagogues in Communist Poland: The Case of Łańcut and Włodawa. In: *Arts* 8(4), 2019, p. 167.
[53] KUREK Jan. Laicyzacja sacrum. Współczesna adaptacja świątyń do nowych funkcji. In: *Przestrzeń i Forma* 15, 2015, p. 234.
[54] MINE Tarak Zeren (2013). Adaptive re-use of monuments "restoring religious buildings with different uses", In: *Journal of Cultural Heritage*, vol. 14, Issue 3, Supplement, June 2013.
[55] ARNO Maria (2021). Adaptation of Historic Sacred Buildings for Secular Purposes keeping the Sacred Function as a Link Between Past and Future. In: *10th Annual Conference of* Architecture and Urbanism 2021, p. 111.
[56] MURZYN-KUPISZ, *Przywracanie pamięci* … p. 385.

Nowosielski and Bałka. According to Starmach, the answer to the question of whether it is appropriate to exhibit such works is quite clear: art in the historic interior of the former house of prayer gains the setting it deserves.[57]

Fig. 13: *SEMPER FRAGMENTUM exhibition*, a sculpture made of *trylinka* paving blocks, 100 cm x 100 cm x 210 cm, photograph by Artur Jasiński.

In the summer of 2023, the Starmach Gallery held the SEMPER FRAGMENTUM exhibition by Mirosław Bałka. It was the first exhibition in the quarter of a century since the opening of the gallery to directly refer to the Jewish roots of this place. The context of the Hasidic house of prayer was of great importance here because Mirosław Bałka frequently pays attention to the context and architecture of the buildings in which he exhibits his works.[58] He is also interested in history: Bałka talks about the heritage of memory, interpreted in a personal way, composed of non-obvious signs and associations. His well-known work dedicated to Jewish memory – a concrete tunnel with the inscription *AUSCHWITZWIELICZKA* – is displayed nearby, in a square by Kotlarski Bridge. Apart from a collection of archival drawings – grouped together and hung, in contrast to how exhibitions are usually presented, not on the walls but on the gallery's pillars so that none of them "dirties" the walls of the former place of worship – the remaining works, prepared especially for this exhibition, have a symbolic meaning. A sculpture composed of six blocks made of *trylinka* stacked on top of one another stands in a little back hall. *Trylinka* is named after its inventor, Władysław Tryliński, and was patented in 1933. Concrete pavements made of *trylinka* were produced in German labour camps and used in the Schindler factory and the Płaszów Camp, for example. On the eastern wall, on the centre line of the building where the Torah ark stood when it was a house of prayer, the artist placed a set of nine framed, graphically processed photographs corresponding to his sculptures made

[57] http://www.starmach.eu/app/pl/about

[58] SZCZEPANIAK Andrzej (ed.). *Mirosław Bałka. Semper fragmentum.* Kraków: Starmach Gallery, 2023, p. 41.

of fencing mesh.[59] This composition is a sort of stained glass window in which the facade of the building and a yellow neon light showing the number 766 are reflected. The yellow light brings to mind the yellow colour of the Star of David badges that Jews were forced to sew onto their clothes during the Nazi occupation, while the number 766 refers to the number of Jewish houses of prayer that existed in Poland before World War II. Here, the history of the Zucker House of Prayer, adapted into a gallery of contemporary art, comes full circle.

Fig. 14: *A graphic installation where the Torah ark used to stand, reflecting a neon number 766, referring to the number of Jewish houses of prayer that existed in Poland before World War II,* photograph by Artur Jasiński.

Post Scriptum

In November 2023, the press revealed that Andrzej and Teresa Starmach had decided to donate a significant portion of their collection of the most outstanding works of Polish contemporary art, built up over a period of many years, to the city of Kraków. MOCAK Museum of Contemporary Art received 79 works, mainly paintings and sculptures, including by Władysław Hasior, Tadeusz Kantor, Edward Krasiński, Magdalena Abakanowicz and Mirosław Bałka. MuFo Museum of Photography received a collection of 344 works, including works by artists such as Maria Deskur, Jadwiga Sawicka, Andrzej Lachowicz and Marek Piasecki. [60] This donation is comparable to that made by Feliks Jasieński, who over a hundred years ago gave paintings by Wyspiański, Malczewski, Wyczółkowski and others, to the National Museum in Kraków together with a collection of Japanese art. By making this donation, Andrzej and Teresa Starmach have left their mark on the history of Polish museology and art collecting.

[59] ROTTENBERG Anda. *Zawsze fragment.* In: SZCZEPANIAK, A. (ed.). *Mirosław Bałka. Semper fragmentum.* Kraków: Starmach Gallery, 2023, p. 31.
[60] MUCHA, Dominika (ed.). *Daj mi wszystko: dar Teresy i Andrzeja Starmachów dla Krakowa.* Kraków: MOCAK 2023.

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Medieval Sacral Architecture in Banská Štiavnica – Architectural Interpretation

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Medieval Sacral Architecture in Banská Štiavnica – Architectural Interpretation
Knowledge about the architectural–historical development of medieval sacral buildings in Banská Štiavnica has gained clearer contours in recent years thanks to many new findings from monument research and published studies that have been processed in the last two decades. Based on these scientific documents, we have elaborated on the theoretical reconstructions of the medieval architectural form of the churches and chapels of Banská Štiavnica from the thirteenth to the middle of the sixteenth century: Romanesque churches and chapels: the Church of the Virgin Mary, the Chapel of St Michael and the monastery Church of St Nicholas; Gothic churches and chapels: the Hospital Church of St Elizabeth of Hungary, the castle Chapel on Glanzenberg Hill, the late Gothic church of Our Lady of the Snows, the Town Hall Chapel of St Anne and the Church of St Catherine. The authors connect new knowledge with their recent research into the medieval residential development of the city.

Keywords: Banská Štiavnica, Middle Ages, sacral architecture, architectural interpretation, Gothic architecture

1. Introduction – historical context of the researched site

> *"[L]let's not stop creating reconstruction proposals; during their preparation, we must examine the monument as thoroughly as possible, and by drawing up a plan, we can make research easier for others."*[1]

[1] BUDAY, Peter. *Koloman Lux: Starý zámok v Banskej Štiavnici (Pramene k dejinám a ochrane pamiatok na Slovensku).* Bratislava: Vydavateľstvo STIMUL, 2020, pp. 101.

Considered the oldest mining town in Slovakia, it is believed that Banská Štiavnica received town privileges between 1238 and 1239.[2] The oldest settlement in this area began to take shape at the turn of the twelfth century in the caldera valley, today known as the Štiavnicas Hills (Štiavnické vrchy). The oldest sacral buildings have been identified as those in the original core of the settlement. It is indisputable that the urban settlement structure developed in the immediate vicinity of the confluence of two streams, the same place in which the Spitaler ore-bearing vein probably came to the surface. During the development of the city, the morphology of the original terrain was certainly significantly changed by mining activity.

Although a medieval settlement with residential, sacral and administrative functions was gradually formed in the valley, archaeological traces reveal mining activity right in the town (metallurgical buildings and operations were very likely mixed with residential buildings in the beginning). The boundaries of the medieval (Romanesque) city can be deduced from the location of two churches dating from the thirteenth century.[3] It is likely that when planning their construction, these churches with their fenced areas were located on the edge of the urban structure.

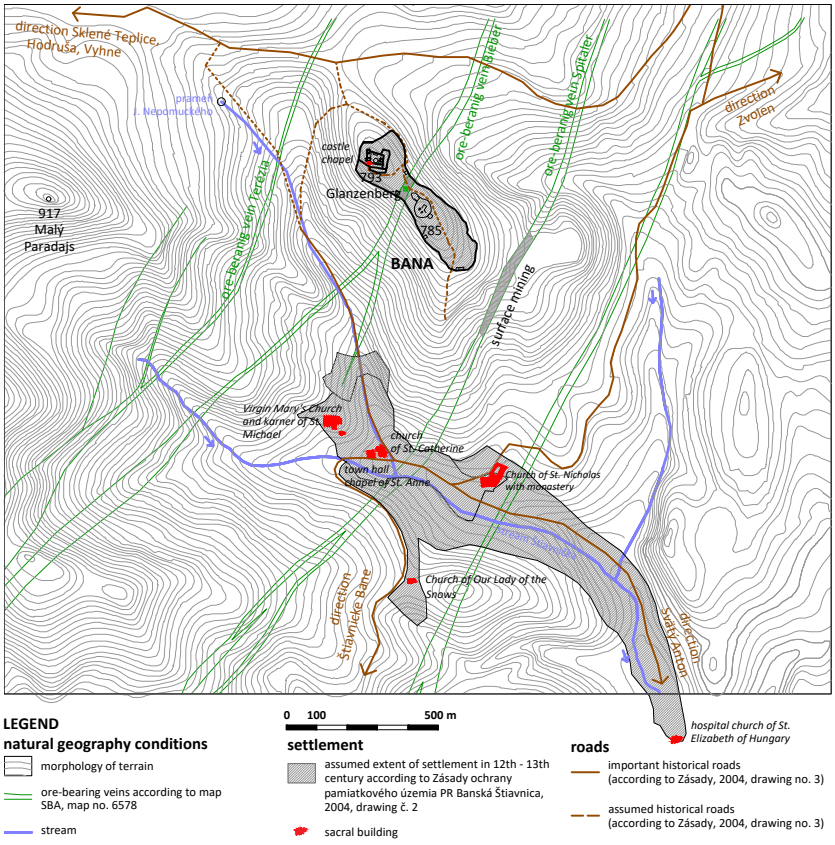

Fig. 1: *General plan of the city of Banská Štiavnica marking religious buildings until 1526.* Author: Lýdia Budayová

[2] MARSINA, Richard. Najstaršie mestá na Slovensku na základe historických dokladov. In: *Archaeologia historica,* 1985, vol. 10, no. 1, pp. 85–92.

[3] GREGOROVÁ, Jana; KLAKOVÁ, Oľga & KVASNICOVÁ, Magdaléna. *Zásady ochrany. Pamiatková rezervácia Banská Štiavnica – historické jadro, Pamiatková rezervácia Banská Štiavnica – Kalvária*, 2004, Bratislava: Pamiatkový úrad SR, drawing No. 4. https://www.pamiatky.sk/fileadmin/documents/news/ZASADY/Banska_Stiavnica/01.1-text-BS.pdf

In the fourteenth century, mining of precious metals (especially silver) and the related metallurgical industry developed, and this was a stimulus for the growth of the city. Gradually, other religious buildings were built according to the needs of the time. In the southeastern part of the city near the main road from village of Svätý Anton, we find the Hospital Church of St Elisabeth. The Castle Chapel in the Royal Castle is on Glanzenberg Hill within the fortified residential–mining settlement. In the southern part of the city near the main road from Pukanec, we find the funeral Chapel of Our Lady of the Snow (Frauenberg), the Town Hall Chapel of St Anna and the new parish church of St Catherine (Fig. 1). Sacred buildings were subject to structural changes and reconstructions necessitated by, for example, destruction (political unrest, earthquakes or other natural disasters); modernisation and adaptation to current needs in the spirit of the latest structural and technological knowledge; or modifications in response to church reforms.

2. Research aims and methods

At present, scientific knowledge about the development of buildings and architectural styles is often interpreted incorrectly and misleadingly to the lay public in Slovakia. Hypothetical reconstructions of the appearance of medieval architecture are in many cases created without drawing on the results of scientific research. Few experts in historical building development know about the forms of mediaeval architecture in Banská Štiavnica. Moreover, important data from current scientific research on mediaeval architecture remains unused and stored in archives. Most of the hypothetical reconstructions of the oldest sacral architecture in Banská Štiavnica and elsewhere were attempted by the architect Václav Mencl in 1937. Since then, knowledge in the field of architectural–historical development has evolved. New knowledge from scientific research has come to light, on the basis of which it is possible to reconstruct the appearance of the sacral architecture in the Middle Ages more reliably and accurately. Theoretical reconstructions of older developmental construction stages of buildings are also among the educational tools used in the field of architecture, history and history of architecture. Therefore, this study presents a scientific architectural interpretation of the built form of the sacral architecture of Banská Štiavnica. The research focuses on the medieval architectural form of the churches and chapels of Banská Štiavnica from the thirteenth to the middle of the sixteenth century. These include Romanesque churches and chapels – the Church of the Virgin Mary, the Chapel of St Michael and the monastery Church of St Nicholas – and Gothic churches and chapels: the Hospital Church of St Elizabeth of Hungary, Castle Chapel on Glanzenberg Hill, the late Gothic church of Our Lady of the Snows, the Town Hall Chapel of St Anne and the Church of St Catherine.

To interpret the sacral buildings in the city during the Middle Ages, our methodology consisted of summarising mentions and images of the architectural form of individual sacral objects in archival sources (on historical maps and vedutas), as well as reviewing relevant architectural–historical and restoration research in published studies and from our own research on the topic, often in collaboration with authors of recent publications on the topic.

The collection of data for the hypothetical reconstructions mainly involved studying textual and graphic aspects of architectural–historical and restoration research. When collecting data, we focused on selecting information that characterises the medieval construction stage of the churches (Romanesque and especially Gothic period). The information was assessed critically

and any data or theoretical reconstructions that were scientifically inaccurate or based only on assumptions were discarded.

Even the most recent research does not provide all the information needed to derive a theoretical graphic reconstruction of the medieval appearance of the sacral buildings in Banská Štiavnica. Therefore, we differentiate certainty from uncertainty by the use of full and dashed lines in our graphic reconstructions. Full lines represent exact, research-confirmed representations; structures (such as a roofs) that have not been preserved and all traces have been destroyed are marked with dashes. We graphically reconstructed highly probable forms (dashed) on the basis of analogous preserved examples or on analogies from historical depictions (roof slopes, circular rosette windows in gable walls, and so on).

As part of the theoretical reconstructions, floor plans, views and in some cases also sections were depicted.

3. Data collection and hypothetical reconstruction of medieval churches in Banská Štiavnica

3.1 Virgin Mary's Church, the Chapel of St Michael with ossuary and All Saints' Chapel (Old Castle/ Starý zámok)

The parish Church of the Virgin Mary, also called the Church of Our Lady, was originally located on the site of a military fortress generally known as the Old Castle (Starý zámok).[4] According to research conducted on the walls, it was already enclosed by a wall before the fourteenth century.[5] The sacral complex, which originally included a burial ground, was situated on an elevated slope above the valley of Štiavnica River, which flowed through the valleys of the Paradajz and Glanzenberg hills.

3.1.1 The Parish Church of the Virgin Mary

Czech historian of architecture Václav Mencl described the oldest form of the late Romanesque three-nave basilica of the parish church of the Virgin Mary.[6] At the end of the 1990s and the beginning of the twenty-first century, archaeological and restoration research on the sacristy near the sanctuary of the church confirmed the existence of a semicircular apse of the side nave. During the restoration of the walls, a triumphal arch between the northern aisle and the original apse was also discovered and presented. The space of the sacristy is vaulted by a Lombard-type cross rib vault with a rectangular rib profile.

The massive walls of the late Romanesque three-nave basilica from the first half of the thirteenth century are still visible today, including a part of the masonry towers of the western facade above the vestibule, the lowered crown of the masonry of the original tower, and the massive foundation bases of the round pillars between the main and side aisles. The vault of the main and side naves was woven into the pillars, and the main nave was finished with a rectangular sanctuary.[7]

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[4] BUDAY, Koloman Lux..., p. 49.

[5] KODOŇOVÁ, Mária, ČISÁRIKOVÁ, Emília & ČISÁRIK, Ladislav. *Stavebnohistorický* výskum opevnenia Starého zámku v Banskej Štiavnici. Bratislava: Slovenský ústav pamiatkovej starostlivosti a ochrany prírody, 1978. Archive of Monuments Board of Banská Bystrica, Regional Office Banská Štiavnica, T 692.

[6] MENCL, Václav. *Stredoveká architektúra na Slovensku. Kniha prvá. Stavebné umenie na Slovensku od najstarších* čias *až do konca doby románskej*. Praha – Prešov: Nákladom Československej grafickej unie Úč. Spol., 1937, pp. 191–198.

[7] Ibidem, p. 194.

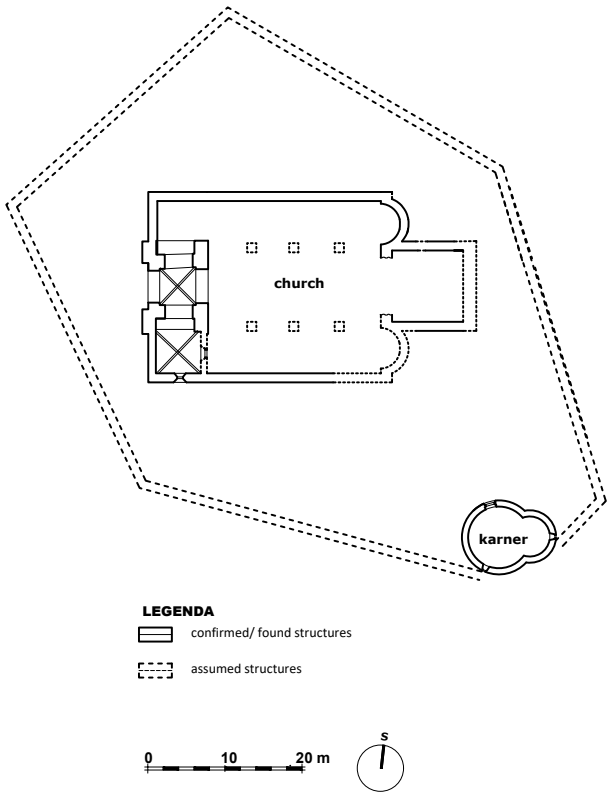

Fig. 2: *Floor plan of the first above-ground floor of the theoretical reconstruction of the Church of the Virgin Mary from the first third of the thirteenth century*. Authors: Lýdia Budayová and Katarína Terao Vošková.

In the theoretical graphic reconstruction of the late Romanesque three-nave basilica, we used Lux's description from 1915[8] and Mencl's description.[9] We also drew on the architectural–historical research carried out by Michal Šimkovic[10] during the last partial restoration of the monument in the late 1990s and early 2000s, and on restoration research[11] from the same period. However, due to the lack of information about the height of the crown of the masonry, window and door openings and the construction of the ceiling and roof, a complete reconstruction of the church's appearance was not possible. The knowledge we possessed only allowed us to draw a reconstruction of the floor plan of the ground floor of the church (Fig. 2).

After devastating political unrest (1442) and an earthquake (1443), the church was almost certainly damaged enough to require radical repairs. The Romanesque basilica was rebuilt as a three-nave hall temple and the rectangular Romanesque presbytery was extended by a polygonal apse with supporting pillars. The temple's late Gothic vault was woven into the profiled pillars between the main and side aisles and into the massive stone brackets of white tuff preserved on the northern perimeter wall on the first floor. In today's open courtyard of the citadel, we can also see the imprint of the late Gothic vaulting of the main nave and the walled triumphal arch. Restoration research revealed an early Gothic bifora window (on the northwest wall) and an early Gothic window with a pointed arch (on the north wall). During archaeological research at the end of the 1990s, the foundation of the side vestibule (chapel?) of the church was uncovered. Dates of construction modifications in the Late Gothic style are directly indicated on the construction. We find the date 1497 on the late Gothic portal, secondarily placed between the sanctuary and the sacristy, while the year 1515 is visible on one of the supporting pillars of pink andesite

[8] BUDAY, Koloman Lux…, p. 59.

[9] MENCL, Václav. Stredoveká architektúra..., pp. 189–202.

[10] ŠIMKOVIC, Michal. *Pamiatkový výskum. Banská Štiavnica, Starý zámok – juhovýchodná veža. Výskum exteriérových fasád,* 2004. Archív Krajského pamiatkového úradu Banská Bystrica, pracovisko Banská Štiavnica/ Archive of Monuments Board of Slovak Republic Banská Bystrica, Regional Office Banská Štiavnica.

[11] MITZOVÁ, Eva. *Banská Štiavnica – Starý zámok. Tzv. Hodinová veža*, Banská Štiavnica: Monuments Board of the Slovak Republic, Regional Office in Banská Štiavnica, 2003, the part of the permition for Conservation of the Old Castle tower, document No: BB-03/656/139/KV, where the mention of archaeological situations is explicitly stated, pp. 1–9.

which is incorporated into the strengthened southern perimeter masonry of the citadel. Newer finds from that period include the original paving in the interior of the sacristy, uncovered at the level of the threshold of the saddle portal, which opened into the spiral staircase (on the exterior wall of the sacristy). In that period, a late-Gothic extension of an architecturally elaborate spiral staircase was also built, connecting the sanctuary of the church to the choir; it could have led to the former sacristy.

After losing the battle near Mohács in 1526 and, especially, following the fall of Ostrihom in 1543, it was necessary to respond promptly to the serious threat of the Ottoman occupation of Hungary. As a result, the late-Gothic reconstruction of the church was apparently never completed.[12] Instead, the church was reconstructed as a military fortress between 1546 and 1559; the appearance of this structure has survived to this day without major structural changes.

Between 2000 and 2002, architectural–historical research by Michal Šimkovic[13] and restoration research on the interior by Eva Mitzová[14] was carried out in some of the rooms in the former aisles of the church and in the Gothic entrance (the so-called Clock Tower).

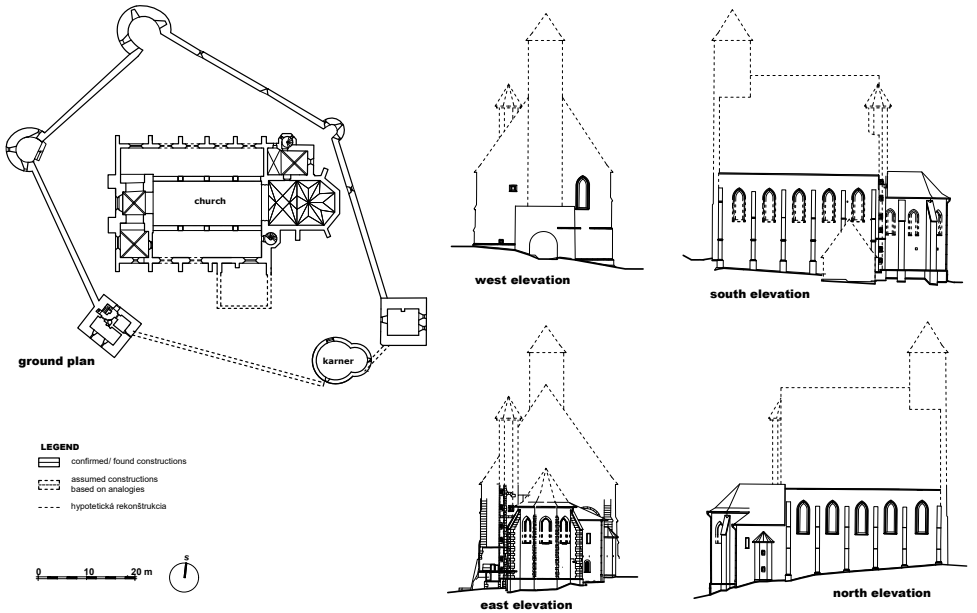

Fig. 3: *Theoretical reconstruction of the Church of the Virgin Mary between 1515 – 1575.* Author: Lýdia Budayová

Koloman Lux addressed the reconstruction of the Gothic form of the church in 1515 in his dissertation, written in the early twentieth century. Regarding the two construction stages, he stated that one dates from the beginning of the thirteenth century, the other from the late fifteenth or early sixteenth century (certainly no later than 1515). He even reconstructed the shape of net vaults in the floor plan of the church.[15] Due to the lack of preserved fragments,

[12] KRESÁNEK, Peter. *Slovensko Ilustrovaná encyklopédia pamiatok. Historická architektúra. Pamiatky výtvarného umenia. Pamätihodnosti.* Bratislava: Simplicissimus, 2009, p. 520.

[13] ŠIMKOVIC, Michal & VOŠKOVÁ, Katarína. Obnova Starého Zámku v Banskej Štiavnici. In: *Projekt*, vol. 53, No. 4-5, 2011, pp. 62-67.

[14] MITZOVÁ, Banská Štiavnica – Starý zámok. Tzv. Hodinová veža..., p. 9.

[15] BUDAY, Koloman Lux..., p. 65.

it is not possible to verify whether his reconstruction was plausible. In the same study, he also reconstructed the stone lining of the secondary stone portal (originally the western portal of the church), into which he "set" the preserved door leaves, and in the drawing he reconstructed the shape-demanding fittings based on his preserved (still clearly visible) prints. This reconstruction of the portal was based on the contemporary Gothic portals of the Church of St Catherine in Banská Štiavnica and the church in Banská Hodruša.[16] The Gothic form of the church from 1515 was theoretically reconstructed by the architect Ivan Hrušovský.[17]

The theoretical material reconstruction of the Gothic form of the church (Fig. 3) was based on descriptions from Václav Mencl's research[18] and on other research and theoretical reconstructions up to the present day. The height and shape of the tower's roof remain an unanswered question. Analogously, by adopting patterns from preserved Gothic sacral architecture, we attempted to reconstruct the height and shape of the roof of the tower above the main entrance. The heights and the angle of inclination of the roof over the main and side aisles are also only hypothetical and are based on the proportions of preserved Gothic architecture. A Gothic arched window is preserved in the first western axis of the north-side aisle and curved arches of the Gothic windows are preserved in the presbytery.

3.1.2 Chapel of St Michael with an ossuary

On the hill near the parish church of Our Lady stands a solitary Late Romanesque circular chapel with a semicircular apse, dedicated to St Michael. It is a two-storey building. The ground floor was used for funeral rites for the deceased before burial. In the basement was an ossuary, or *karner*, where bones from the adjacent burial ground were placed. The Late Romanesque ossuary is a tall space vaulted by a ribbed vault with radially converging stone ribs of a square profile which rest on a central stone column. The existence of a karner can indicate the location of an older burial place.[19] The perimeter quarry masonry of the chapel and the worked grey–green stone blocks are characteristic of the late Romanesque style of Banská Štiavnica.[20] The style-defining elements here are two late Romanesque door jambs, built of worked stone blocks, almost perpendicular to the perimeter masonry, with a segmental arch in the lintel. The overall appearance of the interior bears traces of Gothic reconstruction which probably took place after the devastating years 1442–1443. Adjacent to the semicircular apse is a Gothic window with a trefoil, and with fragments of Gothic plaster with fresco decoration of plant motifs. It is not entirely clear whether the traces of the preserved consoles with the approaches of square ribs and the highlighted stone round cornice in the apse of the chapel are related to the late Romanesque stage or to the modification of the space in the Gothic period. The preserved ribs, apparently already part of the Gothic dome, converge radially into the central vault,[21] as is the case in the karner in Kremnica.

[16] Ibidem, pp. 59–62.

[17] DVOŘÁKOVÁ, Viera & TÓTHOVÁ, Štefánia. *Banská Štiavnica a okolie. Svetové kultúrne dedičstvo.* Bratislava: Pamiatkový ústav, 1995, p. 13.

[18] MENCL, Stredoveká architektúra..., pp. 191–198.

[19] ŠIMKOVIC, Michal. Kostol v urbanistickom kontexte neskorostredovekého mesta. In: VOŠKOVÁ, Katarína (ed.). *Kostol sv. Kataríny* v *Banskej* Štiavnici – *klenot neskorej gotiky na Slovensku*. Banská Štiavnica: Spolok Banskej Štiavnice '91, 2017, pp. 37–43.

[20] PAULUSOVÁ, Silvia: Nálezy románskej architektúry v Banskej Štiavnici. In: *Pamiatky a múzeá : revue pre kultúrne dedičstvo*, vol. 43, No. 5-6, Bratislava: Slovenské národné múzeum, Pamiatkový ústav, 1994, pp. 36–37.

[21] VOŠKOVÁ, Katarína. Stredoveká Banská Štiavnica. Výsledky prebiehajúce výskumu podoby mesta. In: *ALFA,* vol. 24, no. 2, Bratislava: Fakulta architektúry a dizajnu STU, 2019, p. 10 (See Gothic vault reconstruction).

A theoretical reconstruction of the karner of St Michael was attempted by Koloman Lux in his 1915 dissertation.[22] He stated: "Fragments of the walls and building elements of the Banská Štiavnica karner are sufficient for us to be able to most likely reconstruct its original form."[23] Lux no doubt saw the karner in a better state of preservation compared to today, especially with regard to the facades. He drew a small vestibule with a gable roof above the entrance to the ossuary. Under the roof, he reconstructed the arched frieze as well as the stone masonry of the portals and windows, perhaps based on the examples of other karners and apses mentioned in the text: Nitra, Bíňa, Kremnica, Ják, Öskü and Tulln. In addition, according to Václav Mencl, M. Mészáros processed the section–axonometry of the karner.[24] Therefore, we did not produce a new reconstruction.

3.1.3 Chapel of All Saints

Archival sources mention the chapel of All Saints as being in the location of today's Old Castle. Its existence is indicated in older literature and is based on the "Consignatio der Bullenbriefe" from 1514.[25] Some authors assume that it could be located in the Gothic entrance (so-called Clock tower).[26] The elaborateness of the late-Gothic mesh vault with stone profiled ribs resting on stone consoles – an architectural structure that seems overly decorative for the utilitarian entrance tower to the area – also contributes to speculation that the chapel could have existed partly in this space. Looking back to earlier sources, Ján Otakar Novotný[27] suggests that the rectangular-plan Gothic tower is "perhaps only a converted chapel". Ladislav Šášky notes that "[a] similar square tower was built during the rebuilding of the church on the eastern corner (today's bell tower). The network rib vault of its ground floor indicates that there could have been the chapel of All Saints, mentioned in the archive report from 1511" (Consignatio der Bullenbriefe).[28] Due to the lack of information, we only mention the chapel and did not attempt to reconstruct it.

3.2 Church of St Nicholas (now Church of the Assumption of the Virgin Mary)[29]

The building today known as the Church of the Assumption of the Virgin Mary was built on the eastern edge of the city with an adjacent walled area, strengthening the city's defences.[30] The date of construction is not precisely known, but it was certainly before 1275, when it was handed over to the order of preachers (Ordo prædicatorum) – the Dominicans. In the 1930s, Václav Mencl dated the creation of the church to "a few years after 1222"[31] and characterised it

[22] BUDAY, Koloman Lux…, pp. 47–101.
[23] Ibidem, 77.
[24] The section-axonomentry published In: VOŠKOVÁ, Stredoveká Banská Štiavnica…, p. 10.
[25] NOVOTNÝ, Ján O. *Střední Slovensko. Kultúrněhistorické kapitoly.* Praha: L. Mazáč, 1937, p. 35.
[26] ŠÁŠKY, Ladislav. Pamiatky Banskej Štiavnice. In: *Pamiatky a múzeá*, Vol. 6, no. 1, Bratislava: Slovenské národné múzeum, Pamiatkový ústav. 1957, p. 12.
[27] NOVOTNÝ, Střední Slovensko..., p. 84.
[28] ŠÁŠKY, Pamiatky Banskej Štiavnice..., p. 12.
[29] BUDAYOVÁ, Lýdia & CHOVANOVÁ, Iveta. *Pamät' miesta/mesta. Najnovšie poznatky o farskom kostole Nanebovzatia Panny Márie v Banskej* Štiavnici / *A memento of a Monument. New Insight into the History of the Church of the Assumption of Virgin Mary in Banská* Štiavnica. Banská Štiavnica: Roman Catholic Church, parish Banská Štiavnica, 2022, pp. 24–25.
[30] POMFYOVÁ, Bibiana (ed.), BÓNA, Martin, BURAN, Dušan, HEBERLAND, Denis, POMFYOVÁ, Bibiana, RAGAČ, Radoslav, SAMUEL, Marián, ŠEDIVÝ, Juraj, TIHÁNYIVOÁ, Monika & ŽAŽOVÁ, Hendrieta: *Stredoveký kostol. Historické* a *funkčné premeny architektúry.* Vol. 1, Bratislava: FO ART, s.r.o. in cooperation with Institude of Art history SAS, 2015, p. 61.
[31] MENCL, Stredoveká architektúra…, p. 198.

as a three-nave basilica, once flat-roofed, with a transept, a square choir and a polygonal central, and semi-circular side apses. In the middle of the western facade was a single tower, and an emporium passed into both outer bays of the side naves. The emporium, the transept and the squared choir were vaulted by cross vaults with rectangular massive ribs.[32]

Art historians Štefan Oriško,[33] Peter Kresánek[34] and Zala Erklavec[35] agree that the building type is based on the Benedictine church of St Aurel in Hirsau, built in 1082–1091.[36] As a result of probes during his restoration research, restorer Michal Pleidel revealed the remains of capitals of a triumphal arch with stylised leaves, the corner base of the Romanesque presbytery, and the base and capital of the bundle pillar (between the transept and the northern aisle) probably decorated with berry plant ornamentation and other elements.[37]

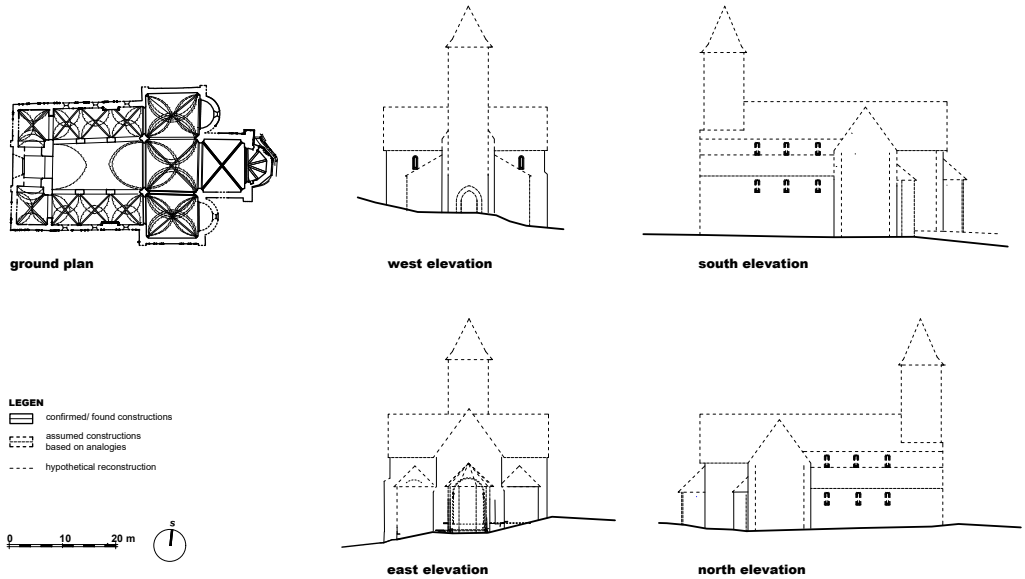

Fig. 4: *Theoretical reconstruction of the Church of St Nicholas, end of thirteenth century.*
Author: Lýdia Budayová

Archaeologists date fragments of the ground floor of the adjacent medieval monastery to turn of the thirteenth and fourteenth centuries, according to remains of material culture.[38] The

[32] Ibidem, 199.
[33] ORIŠKO, Štefan. K umeleckohistorickému významu a charakteristike Kostola sv. Mikuláša (býv. Kostol dominikánov) v Banskej Štiavnici. In: ŠIMKOVIC, Michal & ZVAROVÁ, Zuzana. *Farský kostol Nanebovzatia Panny Márie (kostol farský, č. ÚZPF 2486) – umelecko-historický a architektonicko-historický výskum.* Archív KPÚ Banská Bystrica pracovisko Banská Štiavnica, 2017, p. 232.
[34] KRESÁNEK, Slovensko…, p. 522.
[35] ERKLAVEC, Zala. *Farský kostol Nanebovzatia Panny Márie (bývalý kostol sv. Mikuláša). Neoficiálny súhrn aktuálnych poznatkov a odbornej literatúry,* manuscript. Ľubľana, 2021. Private archive of author, p. 7.
[36] Ibidem, p. 11.
[37] PLEIDEL, Michal, LUPTÁK, Tomáš, KRCHŇÁK, Andrej & KRUŽLÍK, Tomáš. *Rímskokatolícky kostol Nanebovzatia Panny Márie. Správa z reštaurátorského výskumu* a *Návrh na reštaurovanie interiéru a exteriéru,* 2019 – 2020, pp. 171–173 and drawing no. 7. Manuscript. Archive of Monuments Board of Banská Bystrica, Regional Office Banská Štiavnica.
[38] HANUŠ, Martin. Teplovzdušné vykurovanie v stredoveku na území Slovenska. In: *Slovenská archeológia* lXIX – 1, vol. 69, no. 1, 2021, p. 137. Accessed August 1st, 2022. Doi: https://doi.org/10.31577/slovarch.2021.69.5

large-scale construction modifications of the monastery (expansion of its footprint and its extension or rebuilding) took place later, in the Gothic period.[39]

Around the year 1500, the church was connected to the monastery by a portal in the sacristy. In the Middle Ages, supporting pillars and large Gothic windows in the southern-side nave could have been constructed.[40]

A theoretical reconstruction of the 3D model was created using Sketchup software by architect Michal Vaňo under the guidance of Katarína Vošková in 2018.[41] However, at that time the restoration research had not yet been carried out, and the subsequent discovery of Romanesque windows illuminating the transept have subsequently shown this model to be incorrect.

In the graphic volume reconstruction of the church presented here (Fig. 4), we attempt to reconstruct only its original Romanesque form, as in c. 1500 there were only minor modifications.[42] We verified the possibility of a sloping roof under a Romanesque window on the west wall of the transept. The windows were found in the restoration probe by Michal Pleidel during restoration research.[43] The angle of the roofs of the apses, main nave and side aisles are reconstructed analogously. The church's main analogies were the Benedictine church in Hirsau, Germany, and the preserved church of St George in the Hungarian city of Ják (built 1220 – 1256).

In the case of the Dominican monastery, the scale of preservation is too low to conduct a theoretical reconstruction. Locating the connection to the church and the overall situation in the cramped conditions of Banská Štiavnica required an atypical conceptual and construction approach. Therefore, it would be too difficult to reconstruct its appearance according to analogies of other Dominican monasteries.

3.3 Church of St Elizabeth of Hungary (of Thuringia)

This hospital church is first mentioned in 1397,[44] but it was probably built in the middle of the fourteenth century.[45] It served the needs of the hospital and the almshouse and was situated on the southeastern edge of the city, where poorer citizens lived. In the late fifteenth and early sixteenth centuries, the chapels of St Hieronymus and Vavrinc are mentioned in written sources in connection with the hospital but its precise location is not known. The Dominican monastery was taken over by the city in 1536. An almshouse was also placed here, along with an apparent hospital section. Evidently, both hospitals existed for a while – the upper (in the former monastery) and the lower. As a reaction to the danger of an impending Ottoman in-

[39] HANULIAK, Milan. Výsledky archeologického výskumu Dominikánskeho kláštora v Banskej Štiavnici. In: ŠIMONČIČ, Jozef (ed.). *Dejiny a kultúra rehoľných komunít na Slovensku*, Trnava: Trnavská univerzita, 1994, pp. 199–212.
[40] ŠIMKOVIC, Michal & ZVAROVÁ, Zuzana. *Farský kostol Nanebovzatia Panny Márie (kostol farský, č. ÚZPF 2486) – umelecko-historický a architektonicko-historický výskum*, 2017, pp. 234–235. Manuscript. Archive of Monuments Board of Banská Bystrica, Regional Office Banská Štiavnica.
[41] VOŠKOVÁ, Stredoveká Banská Štiavnica..., p. 8.
[42] Measurement of the church by Tender Media Group s.r.o. for Department of Digitalization and Graphic Documentation of the Monuments Board of the Slovak Republic, drawing: Kostol Nanebovzatia Panny Márie. Banská Štiavnica, farský kostol. 11 drawings, 2015. Archive of Monuments Board of Slovak Republic, Bratislava.
[43] PLEIDEL, Rímskokatolícky kostol Nanebovzatia Panny Márie..., pp. 171–173.
[44] ŠTEFÁNIK, Martin. Banská Štiavnica. In: ŠTEFÁNIK, Martin & LUKAČKA, Ján (eds.). *Lexikón stredovekých miest na Slovensku*. Bratislava: Historický ústav SAV, 2010, p. 58.
[45] ŠÁŠKY, Ladislav. Stavebný a umelecký vývoj Banskej Štiavnice. In: GREGA, Vincent & VOZÁR, Jozef (eds.). *Banská* Štiavnica. Banská Bystrica: Stredoslovenské vydavateľstvo, 1964, p. 279.

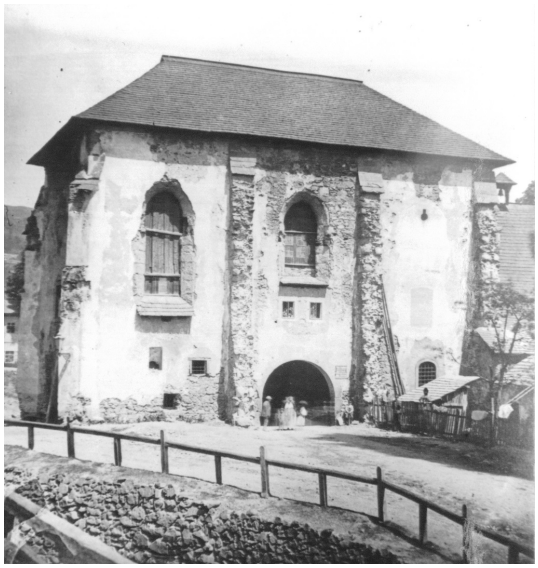

Fig. 5: *The lower gate (formerly the Church of St Elizabeth of Hungary) before demolition, around 1879*. Source: A PÚ SR, Zbierka negatívov, neg. no. 18937.

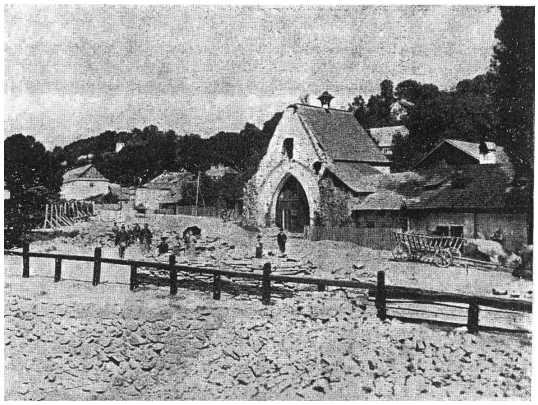

Fig. 6: *The lower gate (formerly the Church of St Elizabeth of Hungary) after demolition, after 1879*. Source: Private archive of Katarína Terao Vošková.

vasion, the nave of St Elizabeth Church was rebuilt in the Lower (Antol) Gate in 1574.[46] In 1879, in connection with the widening of the road and the construction of a railway line, the church's original nave was demolished and replaced by a gate. After the demolition of the former nave/ gate, the presbytery was used as storage. In 1894–1895, the chapel was rebuilt in a neo-Gothic style.[47] During the last reconstruction, the front facade was completed in place of the former triumphal arch. At the same time, the roofing was probably changed and a small wooden bell tower was removed. Restoration research found that the windows of the presbytery were narrowed by 40 cm during the neo-Gothic reconstruction.[48] The Gothic presbytery has been preserved in this form to this day.

Based on analysis of historical photographs[49] which pictured the Lower Gate before its demolition in 1879 (Fig. 5), four nave-supporting pillars can be seen on both the north and south sides (at the corners, set diagonally). On the southern facade there were three Gothic windows with sloped jambs and parapets. A large rose window illuminated the interior from the west side. The original main portal to the church was probably located in the middle field (from the north or from the south) and was later adapted into a passage for wagons passing through the southern and northern walls of the nave. A historical photograph documenting the state after the demolition of the Antol Gate shows a triumphal arch and above it a utilitarian opening separating the nave's attic construction from that of the presbytery (Fig. 6).

[46] ČELKO, Mikuláš, ČELKOVÁ, Mária, PATSCH, Ján. Kostol sv. Alžbety Durínskej v Banskej Štiavnici. In: *Pamiatky* a *múzeá, Revue pre kultúrne dedičstvo,* vol. 62, no. 2, Bratislava: Slovenské národné múzeum a Pamiatkový úrad SR, 2013, pp. 10–11.

[47] BUDAY, Koloman Lux…, p. 21.

[48] Ibidem, p. 14.

[49] Ibidem, pp. 8–15; Archive of Monuments Board of Slovak Republic, Zbierka negatívov, no. neg. 18937; virtualnabanskastiavnica.sk, Historické fotky, Photography no. 2344, accessed August 8, 2022, https://www.virtualna-banska-stiavnica.sk/virtualna-stiavnica/historicke-fotky/historicke-fotky/2344

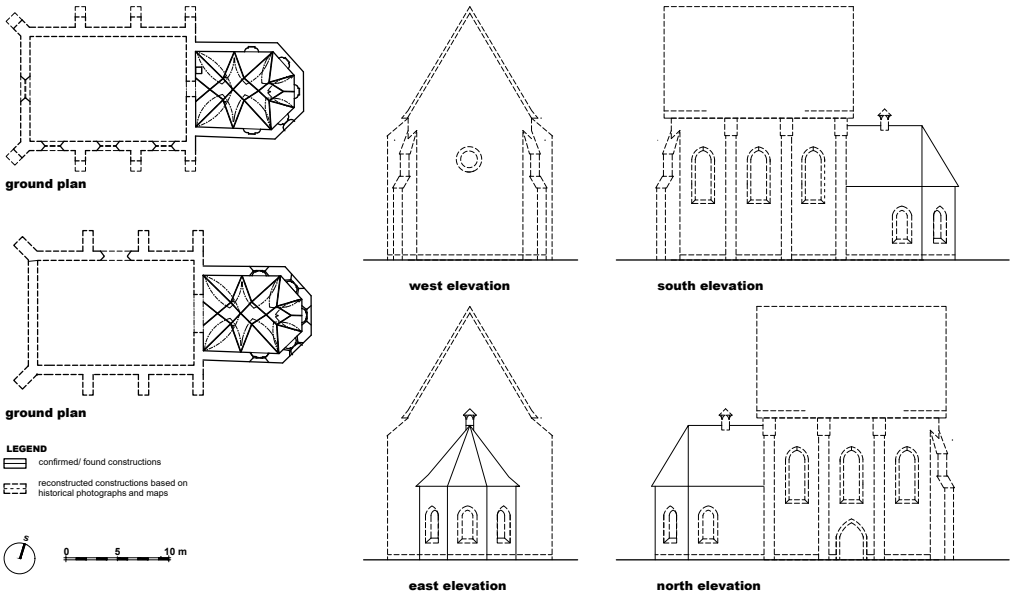

Fig. 7: *Theoretical reconstruction of the Church of St Elizabeth of Hungary in the middle of the fourteenth century.* Author: Lýdia Budayová

The theoretical reconstruction (Fig. 7) was created based on measurement[50] of the interior for restoration research conducted by Ján Patsch[51] and restoration research on the facades carried out by Milan Augustín.[52] The dimensions of the nave were transferred from the cadastral map of 1858. It was possible to transfer (i) the overall proportion of the building (the width and length of the nave to its height) from historical photographs and (ii) the dimension and position of the pillars and the rose window using graphics software. However, the type of vaults in the nave remains unknown because the photographs show the gate as having a utilitarian roof. Based on analogies, we assume that the vault could have had an angle of around 60°. The shape of the western gable is also unknown. Future archaeological research would result in more knowledge of the nave's structure, especially that of the interior. A theoretical reconstruction of the church was conducted by students of the Faculty of Civil engineering Slovak University of Technology in Bratislava, Department of Architecture, under the leadership of architect Jana Gregorová in 2020.[53] We differ from their reconstruction in where we position the portal to the church. The students placed it on the western facade of the nave. They justified this decision by looking at other portals of Gothic churches in Banská Štiavnica. However, keeping

[50] CHOVANCOVÁ, Lýdia & MICHNOVÁ, Zuzana. *Zameranie interiéru Kostola sv. Alžbety,* 2012. Private archive of author Lýdia Budayová (Chovancová).

[51] PATSCH, Ján. *Kostol sv. Alžbety Durínskej* v *Banskej* Štiavnici. *Správa* z *reštaurátorského výskumu* a *návrh na reštaurovanie interiéru,* 2012. Manuscript. Archive of Monuments Board of Banská Bystrica, Regional Office Banská Štiavnica, T 652.

[52] AUGUSTÍN, Milan. *Banská* Štiavnica. *Kaplnka svätej Alžbety. Pamiatkový výskum fasády* a *skrátená rozpočtová dokumentácia,* 1978. Manuscript. Monuments Board in Banská Bystrica, Regional Office Banská Štiavnica.

[53] GREGOROVÁ, Jana. Lokalita južného vstupu do kompaktného historického jadra mesta Banská Štiavnica. *Kostol sv. Alžbety Durínskej/ Antolsko-krupinská brána.* Students´ studio works in study department of Museology, consultants: Vošková, Katarína. Faculty of Civil Engineering Slovak University of Technology in Bratislava, 2020. Obrazová príloha 3/ Attachment 3.

in mind the position of the church within the context of the city, we concluded that it was more probable that the portal was located on the north side of the church, facing the city.

3.4 Private castle chapel on Glanzenberg

The settlement of Bana on Glazenberg Hill (today the archaeological site Staré mesto – Old town) was probably fortified from the thirteenth century. It served for housing, mining (on the Bieber and Spitaler ore-bearing veins) and processing precious metals. The peak *Location 1* in the northwestern part of the area contained a castle area (from a strategic point of view it was the place under greatest threat) with three tower buildings dated to the twelfth and thirteenth centuries. These were archaeologically investigated starting in 1981. The area between them (probably a courtyard) was enclosed by a wall. Up to now, the only sacral building on Glanzenberg was uncovered on the lower terrace attached to the area by Jozef Labuda in 2009–2012.[54] It was a one-nave chapel with a polygonal enclosure measuring 7.6 x 3.5 m[55] with a preserved masonry wall up to 2.4 m high.[56] A total of 117 worked stone elements were found: corner blocks, vault consoles, simple and bundled buttresses, a window archivolt finished with a simple tracery in the shape of a nun, vault ribs with double-sided wedge chamfering, and one bolt from which four ribs extended. No basement for the altar was found in the eastern part of the chapel. Michal Šimkovic, who conducted architectural–historical and art–historical research here, interpreted the site as a private castle chapel which served the inhabitants of the castle exclusively.[57] According to his interpretation, the altar niche was probably located in the masonry of the polygon and the entrance was located on the southern wall. A straight "windowsill" in the southern wall indicates the existence of sedilia. The orientation of the chapel was probably adapted to the conditions of the terrain, but also with an eye to architectural composition and relations below and next to existing buildings of the royal castle. It was built later than the two towers. In the opinion of Michal Šimkovic, the Gothic castle chapel may have had an emporium which could have been connected directly to the tower. Based on the shape of the worked stone blocks, the chapel has been dated to the end of the fourteenth or beginning of the fifteenth century. Researchers Šimkovic and Labuda both associate its demolition with the looting by enemies of Queen Elizabeth and her son Ladislav Pohrobek (Ladislaus the Posthumous) in 1442 and with the earthquake in 1443.[58]

The chapel was vaulted by two fields of a groined vault. According to the bolt (its position when found corresponded to its floor plan projection) the west field was vaulted with a rib vault with an approximately square floorplan. Above the eastern field there must have been a bolt joining six ribs. Based on the stonework blocks found in the area, we assume that the vault was mounted on a console and the eastern field was set on buttresses. These blocks also show that the windows had a simple archivolt with tracery in the shape of a nun. Based on research

[54] LABUDA, Jozef. Glanzenberg v Banskej Štiavnici : archeologický výskum zaniknutej lokality. Banská Štiavnica: Slovenské banské múzeum, 2016, pp. 41-44.
[55] ŠIMKOVIC, Michal. *Banská Štiavnica Staré mesto č. ÚZPF 2922. Hradná kaplnka. Architektonickohistorický a umeleckohistorický výskum,* 2013, p. 30.
[56] LABUDA, Glanzenberg v Banskej Štiavnici…, p. 43.
[57] ŠIMKOVIC, Banská Štiavnica Staré mesto..., p. 30.
[58] LABUDA, Glanzenberg v Banskej Štiavnici..., p. 44. ŠIMKOVIC, Banská Štiavnica Staré mesto..., p. 28.

and after consultations with Šimkovic and Labuda, the author Lýdia Budayová elaborated a theoretical reconstruction of the chapel in her doctoral dissertation.[59]

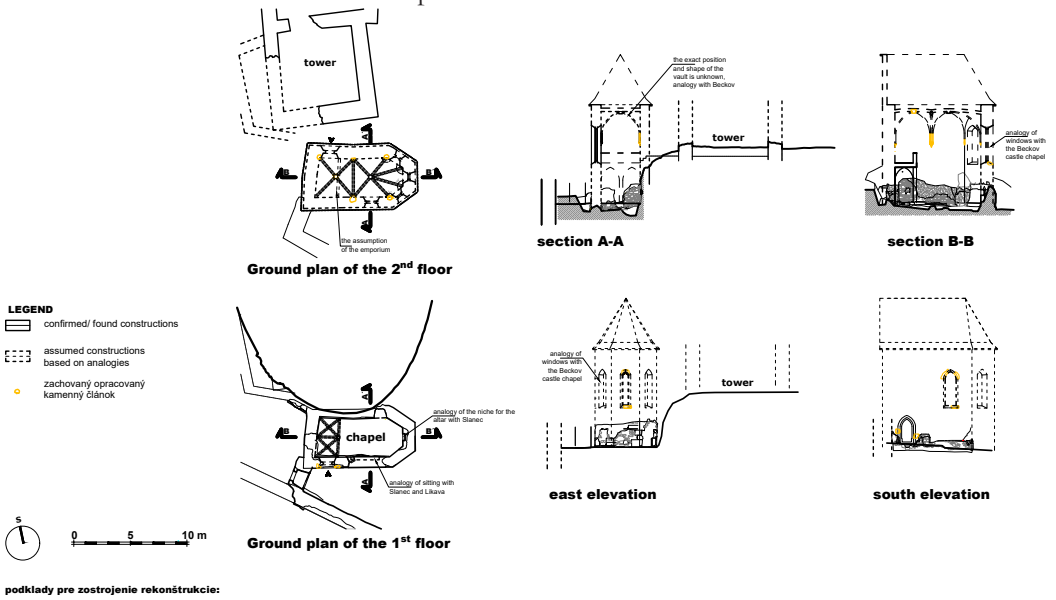

Fig. 8: *Theoretical reconstruction of the church of the castle chapel on Glazenberg Hill (archaeological site "Staré mesto"/ "Old Town") at the turn of the fourteenth and fifteenth centuries.* Author: Lýdia Budayová

The theoretical reconstruction presented here (Fig. 8) was drawn based on historical analogues, namely the private chapels of Beckov, Slanec, Sklabiňa, Strečno, and Likava castles, to which Šimkovic also refers in his research.[60] The reconstruction also made use of the worked stone objects found on site. The height of the emporium was reconstructed analogously. Thanks to the preserved stone block of the archivolt (HK 11/6, HK 11/17) and a fragment of the windowsill (HK 11/22), we can determine the width of the southeast window, from which we can analogously reconstruct other windows. We cannot reconstruct the northern entrance from the side of the tower (if it was there at all) nor the shape of the main entrance to the chapel from the southern side; we only know its width, because only its threshold and two offprints of stone posts were preserved. We reconstructed the shape and slope of the roof analogously.

3.5 Church of Our Lady of the Snows

This church was built in the southern location of the city on a hill "which has been called Frauenberg, Jungfrauenberg, or even Schneeberg (Snowy Mountain) since at least the sixteenth century".[61] The dedication of the chapel to Our Lady of the Snows was inspired by the location.

[59] CHOVANCOVÁ, Lýdia. *Krycie konštrukcie torz architektúry.* PhD diss., Faculty of Architecture Slovak University of Technology in Bratislava. Database of Faculty of Architecture and Design, Slovak University of Technology in Bratislava, 2017, pp. 156–157.

[60] ŠIMKOVIC, Michal. Banská Štiavnica Staré mesto…, pp. 30–34. Manuscript. Archive of Monuments Board of Banská Bystrica, Regional Office Banská Štiavnica.

[61] ČOVANOVÁ, Zuzana & CHOVANOVÁ, Iveta. Aktualizačný list národnej kultúrnej pamiatky rímskokatolícky kostol Panny Márie Snežnej, 2002, 2010. In: *Databáza Informačných aktualizačných listov*. Manuscript. Archive of Monuments Board of Banská Bystrica, Regional Office Banská Štiavnica.

The nave of the church consists of a longitudinal axis in the east–west direction, perpendicular to the access road from Levice or the neighbouring village of Štiavnické Bane.

The literature published so far[62] repeats the dating of the oldest part of the chapel as 1512–1514 and says that it was built by a private donor, Count Erasmus Roessel of Como, as a foundation chapel. Research into the church's facades shows that the present form of the church is the result of several building development stages.[63] The research identified three basic building phases. Based on the findings, the authors of the research assume that a smaller burial chapel was originally built on the hill between 1450 and 1480 (although they did not find any written source that could support this assumption). Its construction was certainly related to the establishment of the new Frauenberg cemetery, when burials stopped around the Church of the Virgin Mary during its reconstruction into an anti-Ottoman fortress. Sura et al. assume an older, smaller funeral chapel, the presbytery of which could have terminated in a square.[64] At the end of the presbytery, their research confirmed a caesura and, subsequently, surface treatments on the facade – and perhaps also different stonework – which can be dated to an earlier period. However, the original extent of the building is not known exactly; it could only be determined on the basis of archaeological research on the interior. The presbytery acquired a polygonal floorplan only in the second stage of construction, around 1512–1514;[65] this period is associated with Count Erasmus Roessel of Como, the donor who had the chapel completed and extended. At that time, it was finished with diagonal buttresses against the western wall which are still visible today and clearly demarcate this stylistic stage. In the same period, the polygonal presbytery was also extended and a brick vault with load-bearing ribs of tracery was built in the late Gothic style. The simple nave was apparently not vaulted: no traces of a vault were found. Probably in the period 1512–1514, a sacristy with a rolled brick vault with lunette sections was added to the presbytery. Between the sanctuary and the sacristy there is a Gothic portal with a profile preserved by channelling in the jambs. In the elongated nave of the temple, a stone staircase with a fragment of a cantilever for the former pulpit has also been preserved in fragments. The nave of the church is separated from the presbytery by a pointed triumphal arch. In the axis of the closure of the presbytery, the interior niche of the Gothic window is preserved. A rose window was inserted into its top. After an exploratory survey, a Gothic bifora window was revealed on the side wall opposite the sacristy.

In 1580, at the expense of the city, the chapel was enlarged. More precisely, its still insufficiently long nave was lengthened. The nave was vaulted with a barrel vault with lunette sections. An emporium was added on the western perimeter wall, supported by two octagonal columns that divide the ceiling below the emporium into three vaulted bays with a cross vault. The emporium was originally accessible from the exterior cemetery. The original entrance portal – profiled with typical bending in the lintel – as well as the entire west wall were destroyed during World War II. The emporium's space was illuminated by a circular window. The church's facade

[62] ŠÁŠKY, Pamiatky Banskej Štiavnice..., p. 12; DVOŘÁKOVÁ & TÓTHOVÁ, Banská Štiavnica..., p. 31; CHOVANOVÁ, Iveta. Urbanistické a architektonické hodnoty Banskej Štiavnice. In: LICHNER, Marián (ed.) *Banská* Štiavnica. *Svedectvo* času. Banská Bystrica: Štúdio Harmony, 2002, p. 155.

[63] SURA, Miroslav, ÚRADNÍČEK, Vladimír, LAČNÝ, Richard, RAJNOHA, Stanislav & ŠAKOVÁ, Anna (1980). *Banská Štiavnica, Kostol P. Márie Snežnej /FRAUENBERG/. Výskum fasád kostola.* Bratislava: Projektový ústav kultúry, stredisko Banská Bystrica, skupina výskumu pamiatok, pp. 23–25. Archive of Monuments Board of Banská Bystrica, Regional Office Banská Štiavnica, T 63.

[64] Ibidem, pp. 30–35.

[65] Ibidem.

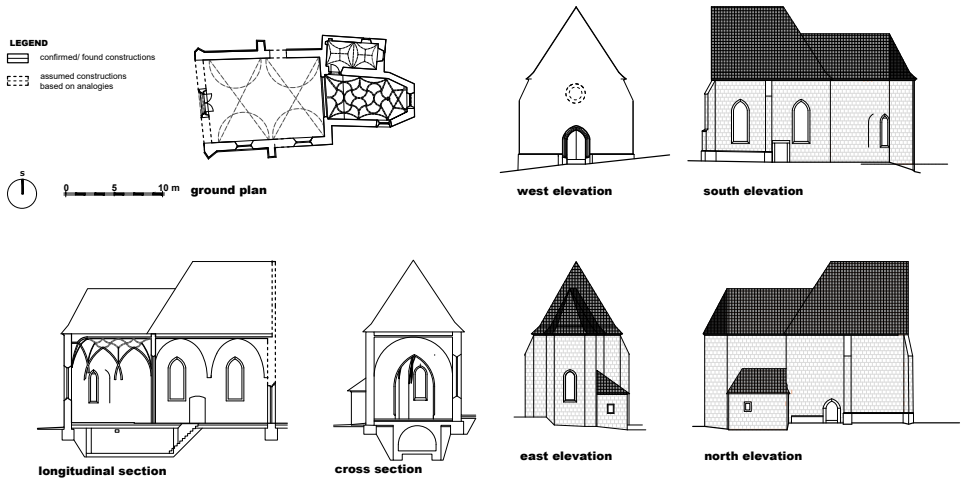

Fig. 9: *Theoretical reconstruction of the Church of Our Lady of the Snows in Frauenberg, 1514. Authors: Martin Fabian and Tomáš Ružiak (under the supervision of Róbert Erdélyi)*, edited by Lýdia Budayová.

was restored in the 1980s, based on preserved fragments of an illusory square painted with a red line on glazed lime plaster with a pre-engraved line.

In the theoretical graphic reconstruction of the Gothic form of the church (Fig. 9), we focused on its late Gothic form, which was intact by 1512–1514. We did not divide the church's phases of development into early and late Gothic, due to a lack of information about the oldest form of the church / chapels (probably from 1450). The development stages were graphically processed by students in the studio,[66] and used as a starting point. In the theoretical reconstruction, we placed the Gothic saddle portal "back" on the western facade; it is assumed it existed in 1512–1514. We can only assume the rose window in this facade.

3.6 Town Hall Chapel of St Anna

The oldest written mention of this chapel refers to Queen Beatrix of Aragon, who allowed the town of Banská Štiavnica to build a chapel from a building belonging to the Town Hall (or connected to it) in 1488.[67] Authors Jozef Gindl and Jozef Vozár[68] incorrectly stated that the chapel of St Anna had been located on the site of the statue of the Immaculate Conception next to the Town Hall. A discovery of a consecration cross during the reconstruction of the Town Hall brought on further research, during which a late Gothic floor was uncovered. Archaeological research on the chapel[69] found that the areas of the chapel and the Town Hall were connected by a doorway from which a spiral staircase led directly to the ground floor and

[66] FABIAN, Martin & RUŽIAK, Tomáš (2009 – 2010). *Kostol Frauenberg. Banská* Štiavnica. Students´ studio works under the Ateliér IV. malý – Obnova pamiatok. Architektúra a urbanizmus. Supervisor: Erdelyi, Robert, consultants: Vošková, Katarína, Kvasnicová, Magdaléna. Faculty of Architecture, Slovak University of Technology in Bratislava, p. 5.

[67] ŠIMKOVIC, Michal. Banská Štiavnica. *Fasády radnice. Architektonicko-historický a umelecko-historický výskum*, 2010. Manuscript. Archive of Monuments Board of Banská Bystrica, Regional Office Banská Štiavnica, p. 40.

[68] GINDL, Jozef & VOZÁR, Jozef. *Banská* Štiavnica *a okolie. Sprievodca po stavebných, umeleckých* a *technických pamiatkach.* Banská Bystrica: Stredoslovenské vydavateľstvo, 1968, pp. 33–34.

[69] LABUDA, Jozef & MIŇO, Martin. Radničná kaplnka v Banskej Štiavnici. In: *Pamiatky a múzeá,* vol. 57, no. 4, 2008, pp. 48–51; LABUDA, Jozef & MIŇO, Martin. Nález radničnej kaplnky sv. Anny v Banskej Štiavnici. In: *Archaeologia historica,* vol. 34, no. 1, 2009, pp. 763–774.

obviously also to the emporium, as indicated by the remains of two columns. Most important was the discovery of a late Gothic lanced portal with twisted feet. The archaeological study, along with architectural–historical and art–historical research carried out by Michal Šimkovic, focused on the northwestern part of the building of the first ground floor. The internal width of the nave was measured as 7.3 m. Subsequent restoration research was conducted by Eva Mitzová. Research on the facades by Michal Šimkovic (2010) was carried out in order to determine whether the details of the chapel were preserved on the facades, as well as the precise length of the chapel. Šimkovic concluded that in the northern half of the Town Hall building the late Gothic masonry of the Town Hall Chapel is still preserved up to the height of the crown cornice.[70] The two-tract layout of the Town Hall dates back to the initial Gothic phase from around 1500. Due to its location (in the area presently known as Town Hall Square), it was in close proximity with the parish church of St Catherine. The Chapel of St Anna was a part of the Town Hall, according to research on the building's development. The north part (closer to St Catherine's Church) was a one-storey building attached to the Town Hall; the western part was the chapel with a tower. The chapel was 18 m long, 9.5 m wide and 10 m high.[71] The arched entrance was decorated with twisted feet in a profiled plinth. The chapel was enclosed by a rectangular presbytery, probably with a corner chamfer in the northeastern part. This corner of the presbytery was probably reinforced with corner pillars. Šimkovic partly uncovered a 2.8 m high object in the northwest corner with the rest of a console projecting into the space in a diagonal direction, which he interpreted as a console for a sculpture with a baldachin.[72] The chapel walls were perforated by a 2 m wide rose window with a chamfered jamb. The chapel facades were finished by a profiled cornice. The plaster around the north portal was ochre coloured with a rough, slightly undulating texture and red lines imitating square work. Probes on the facade identified the position of the windows, the ventilation opening and the door of the Town Hall. There might have been additional windows within the locations of the current ones; if so, they cannot now be detected. A bow window could have been present in place of the balcony. Probes on the facades uncovered squaring – a black line on a white background. The main portal was lined with a solid red *passe-parta*, and the windows were framed with a red line.[73] The vault under the gallery was probably groined or stellar,[74] but the vault spanning the nave and the presbytery of the chapel was not found. Archaeological research found that in the late Middle Ages, the chapel had a burnt troughed roof covering and blown glass targets in window fillings.[75] The fact that the city of Banská Štiavnica had at the same time a relatively large chapel and the representative Church of St Catherine can be explained by the need for a chapel in which to perform frequent ceremonial rituals in connection with the administration of the city. Today, the Town Hall building has a classicist character due to its reconstruction in 1787–1788 according to the plans developed by the architect known as Master Pircker. At this point in time, the chapel ceased to function as an ecclesiastical space.[76]

[70] ŠIMKOVIC, Fasády radnice…, p. 43.
[71] Ibidem, p. 45.
[72] Ibidem, p. 43.
[73] Ibidem, p. 44.
[74] ŠIMKOVIC, Michal. *Banská Štiavnica. Architektonicko-historický a umelecko-historický výskum kaplnky radnice*, 2008, p. 20.
[75] LABUDA & MIŇO, Radničná kaplnka v Banskej Štiavnici, p. 51.
[76] ŠIMKOVIC, Banská Štiavnica. Architektonicko-historický…, p. 40.

The research found part of the northwestern support pillar, while other support pillars were drawn according to the geometry of the floor plan.[77] The shape of the chapel vault and the roof are not known. The lower, single-storey part of the Town Hall may have been covered with an open gable or a shed roof. We ultimately drew a shed roof, as we consider it a technically more correct solution. In the theoretical reconstruction (Fig. 10), we drew windows which Michal Šimkovic believes were in the position of the current windows and added bow windows in place of the balcony. We also added the statue with the baldachin in the northwest corner, but with a lower degree of certainty. The theoretical reconstruction was created by Lýdia Budayová during an international workshop titled Autumn University of Architecture 2019.

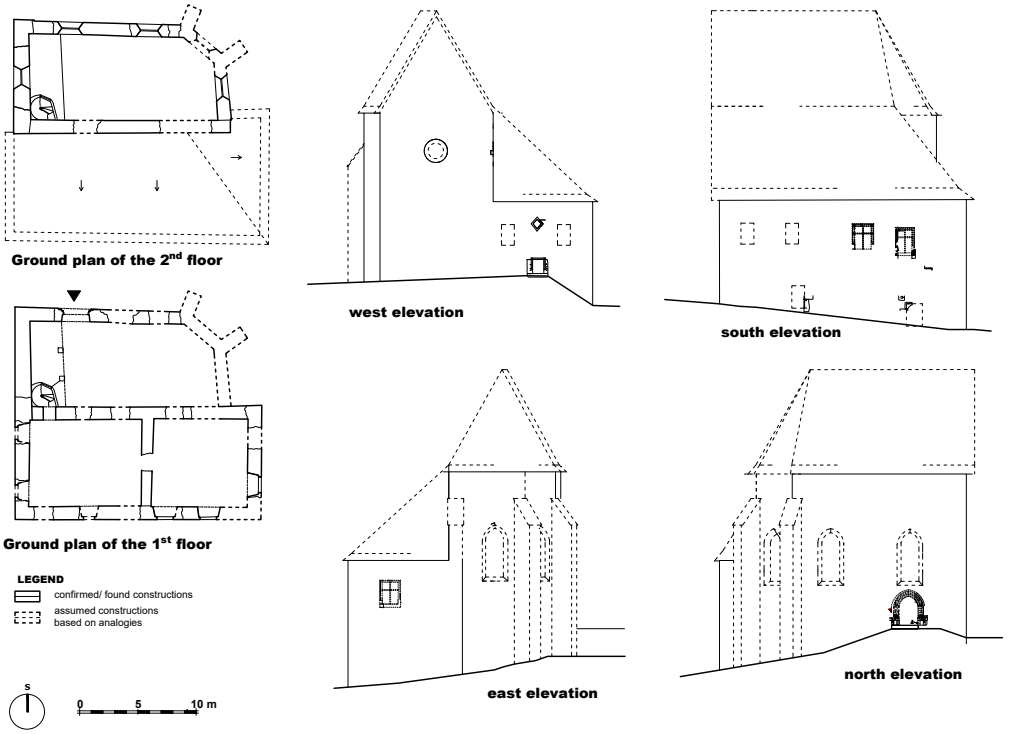

Fig. 10: *Theoretical reconstruction of the Town Hall Chapel of St Anna around 1500*. Author: Lýdia Budayová.

3.7 Church of St Catherine of Alexandria (also called the Slovak Church)

No direct written sources about the construction of the church have been preserved. Its existence or the intention behind its construction are indicated only through indirect mentions from the years 1489 and 1491. The earliest document referring to the church's construction is from 1500, where its consecration is recorded.[78] The construction of the church was very likely related to the overall urban development of the valley below Glanzenberg – today's Holy Trinity Square. It is assumed that at that time foundational landscaping was undertaken in order to create a square in the narrow valley; until then there was no square in the already fully developed medieval city. Until then, only solitary Gothic houses existed, mostly oriented

[77] Ibidem, drawing no. 1.

[78] ORIŠKO, Štefan. Architektúra. In: VOŠKOVÁ, K. (ed.). *Kostol sv. Kataríny* v *Banskej* Štiavnici – *klenot neskorej gotiky na Slovensku*, Banská Štiavnica: Spolok Banskej Štiavnice '91, 2017, p. 56.

with their longitudinal axes to the slope, with cellars and mining tunnels continuing smoothly deep into the underground parts of the slope that rises on both sides of the square. At the same time the landscaping of the square was taking place, a spectacular reconstruction of older, smaller medieval houses in the late Gothic style also began.[79] Under the slope with the Romanesque–Gothic Church of the Virgin Mary, today's Old Castle – a magnificent, but still spatially limited square on both sides of the slope – was formed. The church was located in the centre of the city, at the border of the southernmost extended part of the square and the main communication axis (today's A. Kmeťa Street and Radničné (Town Hall) Square). Due to the narrow morphology of the terrain, the placement of the church required a southwest–northeast orientation.

The church has been intact since its inception, without any major reconstruction, preserving its Late Gothic architectural form. Shortly after it was consecrated in 1550, a vestibule was added to the side on the square. Later in its history, minor modifications were made to the construction of the interior which did not cause any significant change in its appearance and manifested only in the detailing.

A more significant change occurred when the church passed into the hands of the Protestants in 1580. The Gothic emporium rests on curved arches supported by stone columns. Beneath it, in fields defined by columns, are cruciform Gothic vaults. The Protestants added another storey – a wooden emporium with rustic-looking wooden columns – to the original Gothic emporium.[80]

For historians of architecture, the existence of two magnificent Gothic entrances to the side aisles of the church located opposite each other remains a conundrum. Behind the present east-facing vestibule is a large-scale Gothic profiled portal with fragments of fine and precise stonework, which indicate that smaller sculptural figures may have been inserted into the deep profiling of the portal. It is assumed that the portal has a cut-off panel in the lintel with a double saddle, while the stone panel could have been artistically conceived with relief sculptural decoration.[81] The pendant of this portal appears opposite on the west-facing facade of the nave – in front of Loretta's chapel.

The church has a single nave with a star-shaped stone rib vault, which clearly reveals its stylistic association with the late Gothic period. Chapel spaces open between the buttresses, creating the impression of two side-naves. Two are located on the west side (from the side of the Town Hall), in the third field (toward the presbytery) of the sacristy. On the east side, three chapels were originally inserted between the buttresses (one of them was later changed to an entrance hall). Each of the chapels is covered with an original star rib vault pattern. There is no triumphal arch between the nave of the church and the sanctuary: the spaces connect smoothly to each other.

In addition to the artistically elaborate main star vault and the vaults in the side chapels, a number of remarkable architectural details have been preserved in the church: stone consoles with half-figures, stone late-Gothic saddle portals, and a stone spiral staircase to the gallery and

[79] ŠIMKOVIC, Michal. Kostol v urbanistickom kontexte neskorostredovekého mesta. In: VOŠKOVÁ, Katarína (ed). *Kostol sv. Kataríny* v *Banskej* Štiavnici – *klenot neskorej gotiky na Slovensku*. Banská Štiavnica: Spolok Banskej Štiavnice '91, 2017, p. 42.

[80] ŠIMKOVIC, Michal & VOŠKOVÁ, Katarína. Stavebné úpravy v protestantskom duchu. In: VOŠKOVÁ, Katarína (ed). *Kostol sv. Kataríny* v *Banskej* Štiavnici – *klenot neskorej gotiky na Slovensku*. Banská Štiavnica: Spolok Banskej Štiavnice '91, 2017, p. 162.

[81] ORIŠKO, Architektúra..., p. 67.

the roof area. The original altar, made by a "Master MS" in 1506, was replaced by a baroque wooden one with the arrival of the Jesuits in 1727[82] and a pulpit from 1731 in the same style was added.[83] Only the Late Gothic access saddle portal and stone steps remained from the original pulpit. Of the original Late Gothic altar, only the brick plinth remained in situ, along with the altar canteen with a profiled stone cornice around the perimeter. There are neo-Gothic altars in the side chapels. The structure of the truss (the oldest in the city, from 1655) has been remarkably preserved. The church's exterior underwent a change in its silhouette – new finishes in the Baroque architectural style were provided above the sacristy and above the spiral Gothic staircase. The facade of the church was restored between 1978 and 1981 based on the results of architectural–historical research,[84] which revealed the original facade treatment from the Gothic period: pre-engraved and dark grey line-painted squaring on glazed plaster. A stone profiled plinth ledge around the perimeter of the church facades has also been preserved from the Gothic period. On the north side, it borders the wall adjacent to the late-Gothic original entrance portal with busts in the corners, and it is best preserved here, as it has been protected by an added vestibule since 1550.

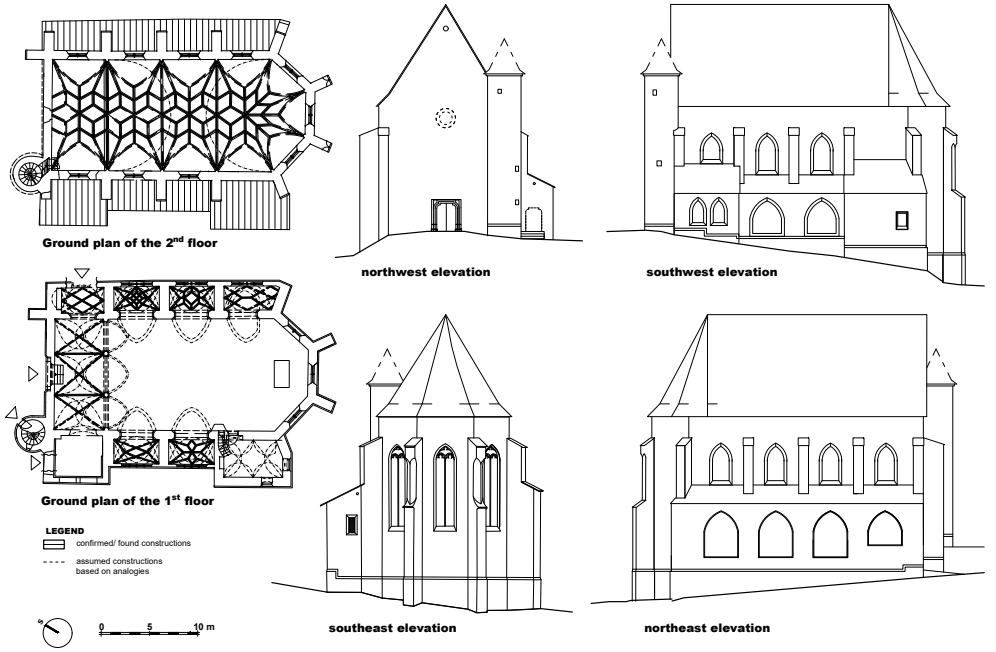

Fig. 11: *Theoretical reconstruction of the Church of St Catherine of Alexandria around 1500.* Author: Michal Šimkovic – Katarína Vošková, edited by Lýdia Budayová.

When reconstructing the visual appearance of the Late Gothic form of the church (Fig. 11), we mainly relied on the interpretation in the monograph *Church of St Catherine in Banská*

[82] BALÁŽOVÁ, Barbora. Umelci hlavného oltára, In: VOŠKOVÁ, Katarína (ed). *Kostol sv. Kataríny* v *Banskej* Štiavnici – *klenot neskorej gotiky na Slovensku*. Banská Štiavnica: Spolok Banskej Štiavnice '91, 2017, p. 195.

[83] ČIČO, Martin. Oltáre a kulty. In: VOŠKOVÁ, Katarína (ed). *Kostol sv. Kataríny* v *Banskej* Štiavnici – *klenot neskorej gotiky na Slovensku*. Banská Štiavnica: Spolok Banskej Štiavnice '91, 2017, p. 205.

[84] GOJDIČ, Ivan & PAULUSOVÁ, Silvia. Banská Štiavnica – kostol sv. Kataríny. Umelecko-historický a architektonický výskum fasád, program pamiatkových úprav, 1977, Archív pamiatkového úradu SR Bratislava, Zbierka výskumných správ, sign. T 1396, pp. 30–33.

Štiavnica – A Jewel of Late Gothic in Slovakia.[85] During its theoretical reconstruction, we drew it without the later additions and the baroque sanctum sanctorum. Based on analogies and architectural logic, it can be assumed that the spiral staircase with a circular floor plan was terminated by a steeper conical or polygonal roof.

4. Conclusions

In recent years, archaeological, architectural–historical, art–historical and restoration research has uncovered several important findings about the development of medieval sacral buildings in Banská Štiavnica. These findings were the stimulus for the present study, due to their scientific architectural interpretation and their theoretical reconstructions of structures built between the beginning of the thirteenth century and the mid-sixteenth century. The paper includes a compilation of current scientific knowledge with critical evaluation, but its main value lies in the theoretical visual reconstructions of the original architecture of the churches in Banská Štiavnica, which have not been the subject of architectural interpretation since the time of Václav Mencl (in 1937).[86] These theoretical reconstructions may provide a suitable basis for the interpretation of medieval sacral architecture and could also complement the image of the medieval mining town as an urban unit. In general, when creating individual theoretical reconstructions, we based them on geodetic measurements, the findings of studies on monuments, and analogous architectural solutions used in the same period and region. Based on verification of the possible shapes of the churches and the technical solutions of the periods in question, we attempted to create visual architectural interpretations.

The architectural drawing of theoretical reconstructions was conditioned by different levels of preservation and findings from various types of monument research. The Chapel of All Saints (mentioned in connection with the Church of the Virgin Mary) and the Chapel of St Hieronymus and Vavrinc (recorded in connection with the hospital) are mentioned only in archival sources, without any traces found in situ thus far. The one-nave Church of St Elizabeth was the least preserved: at the end of the nineteenth century it was demolished without any documentation, and so far there has been no archaeological research on it. The castle chapel on Glanzenberg Hill was only discovered in recent years as a result of archaeological research.

The feature of the churches and chapels with the lowest degree of certainty in our graphic representations was the roofs (the roof was not preserved in any of the churches we examined). Also, in some cases, rosette windows and other window or door fillings were added.

We reconstructed the original Parish Church of the Virgin Mary in Banská Štiavnica in the Late Romanesque phase as a basilica with a square presbytery and two apses. The reconstructed floor plan appears to be an adaptation of the scheme of the Benedictine basilicas to the parish church. Analogous examples of contemporary Benedictine churches with semicircular apses can be found in Diakovce and Čajakovo (Lekýr). This opens up the opportunity for further art–historical research. We also attempted to reconstruct the Late Gothic form of the church (1497–1515) based on Kolomán Lux's account and on other partial monument research carried out from the late twentieth century.

[85] ŠIMKOVIC, Michal & VOŠKOVÁ, Katarína. Stavebná podoba chrámu v období neskorej gotiky. In: VOŠKOVÁ, Katarína (ed). *Kostol sv. Kataríny v Banskej Štiavnici – klenot neskorej gotiky na Slovensku*. Banská Štiavnica: Spolok Banskej Štiavnice '91, 2017, pp. 45–53.

[86] MENCL, Stredoveká architektúra…, pp. 189–202.

Reconstruction of the Romanesque funeral Chapel of St Michael had already been attempted by Koloman Lux (1915), and architect Marcel Meszáros reconstructed the chapel dome with ribs on the basis of Václav Mencl's drawings.

The Church of St Nicholas (today the Church of the Assumption of the Virgin Mary) was probably built on the eastern edge of the city before 1275, when it was handed over to the Order of Preachers (Dominicans) as Capella S. Nicolai de Bana. We verified that the Late Romanesque basilica could have had a transept lit from the west and thus the side aisles were roofed with shallow counter-roofs. In the case of the Dominican monastery, there are too few preserved material documents for its theoretical reconstruction to be possible.

The Church of St Elizabeth of Hungary (Thuringia) is probably from the mid-fourteenth century, and its nave was rebuilt as a city gate in 1574. Based on the analysis of photographs that capture the Lower Gate before its demolition, we reconstructed the church with a nave that had four pillars each on both the north and south sides. On the southern facade there were three Gothic windows with pointed arches with a bankal. A large rose window illuminated the interior from the west side. The original main entrance portal to the church may have been located in the middle field (from the north or from the south).

The private castle chapel at the royal castle on Glazenberg Hill (within the archaeological site Staré mesto – Old town) was hypothetically reconstructable thanks to worked stone elements found during archaeological research and on the basis of contemporary analogies of other single-nave castle chapels.

The Church of Our Lady of the Snows, originally built as a funeral chapel in the new cemetery, was created over the course of several Gothic construction phases. We reconstructed its appearance in the years 1512–1514, when the nave had not yet been extended. In the theoretical reconstruction, we placed the gable Gothic portal "back" in the western facade. We can only assume the existence of a rosette window in this facade.

The Town Hall Chapel of St Anna is still preserved up to the height of the crown cornice in the northern part of today's Town Hall building, while the medieval Town Hall formed the lower southern part. Research has also revealed some window and door openings, as well as the rosette window of the western facade and the northern entrance portal, the arches of the emporium, and part of the support pillar. Other supporting pillars were drawn based on the geometry of the floor plan. We do not know the type of vault which could have spanned the chapel. We tried to reconstruct the shape of the roof of the Town Hall and the chapel, and we consider a counter roof which rests on the southern wall of the chapel to be the technically correct solution.

The Late Gothic Church of St Catherine of Alexandria, consecrated in 1500, has survived to this day in its complete form. During its theoretical reconstruction, we removed later additions and the sanctuary. A rose window on the side of Holy Trinity Square remains hypothetical, as does a shaped roof on the round tower that encase the spiral staircase.

This article does not conclude research into sacred buildings and the medieval architecture of Banská Štiavnica; on the contrary, we believe that in the future it will stimulate multidisciplinary scientific research which will enable a more accurate interpretation of the architectural form of the medieval sacral space in this important mining town. Theoretical scientific reconstructions of the appearance of sacral architecture in the medieval period can contribute to the mosaic of knowledge of medieval sacral architecture in Slovakia and create a visual basis from which to encourage further research in this area.

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Towards an easy-to-implement method of obtaining 3D models of historical wooden churches using a combination of modern techniques

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Towards an easy-to-implement method of obtaining 3D models of historical wooden churches using a combination of modern techniques
Modern 3D computer technologies allow for precise documentation of historic architectural objects by building digital 3D models. For this purpose, 3D laser scanning techniques using terrestrial laser scanning (TLS) and photogrammetry are commonly used. This article presents the use of both technologies for the 3D digitisation of historical wooden churches located in the Carpathian Region in Romania. It describes the methodology used to obtain digital mesh 3D models of this type of objects, from the planning stage, through the process of data acquisition in the field, to methods of data processing and integration of data from two different technologies in order to improve the generated digital 3D models.

Particular emphasis was placed on avoiding cost increases and delays resulting from the need to use non-terrestrial data acquisition methods. The article presents the results of generating 3D models on the example of Orthodox churches in the villages of Creaca, Păniceni, Târguşor and Păusa located in the Cluj region in Transylvania. The results indicate that well-performed data integration allows for obtaining digital 3D models that will also be suitable for dissemination.

Keywords: historical wooden churches; 3D model; 3D scanning; TLS; photogrammetry

1. Research motivation and aim

Cultural heritage (CH) objects, including architectural ones, are exposed to various types of threats leading to their degradation and loss. An attempt at classifying them is shown in Figure 1. Wooden religious buildings (churches, orthodox churches, bell towers, gates, shrines, synagogues and others) are particularly exposed to natural hazards, such as weather conditions and the passage of time, as well as earthquakes[1] and landslides,[2] tornadoes,[3] pests,[4] moisture,[5] fungus,[6] and fire.[7] There are also threats related to human activity, such as armed conflicts and wars, theft, excessive tourist exploitation, inappropriate management, abandonment[8] and intentional destruction (e.g. for ideological/religious reasons).[9]

In Europe, wooden historic churches are mainly only found in Norway where, of the nearly 2,000 stave churches from the twelfth to fourteenth centuries, only 28 structures have survived. One of them was moved to the city of Karpacz in Poland in 1842.[10] In addition, wooden churches have been preserved in Carpathian Region. These are structures from the fourteenth to the twentieth centuries, built of "solid" wood logs[11]. Other wooden churches have been preserved in Upper and Lower Silesia in Poland. An exceptional example there is the Lutheran Church of Peace in the city of Świdnica. Dating from 1657, it is the largest wooden temple in Europe, serving nearly 7,500 believers. It was built using frame wall technology with clay and

[1] VLAHOULIS, Themistoklis et al. Post-seismic restoration project of basilica churches in Kefallonia Island. In: *Transdisciplinary Multispectral Modeling and Cooperation for the Preservation of Cultural Heritage,* 2019, pp. 131–142.

[2] LIPECKI, Tomasz. Non-contact diagnostics of the geometry of a historic wooden building as an element of periodic safety assessment. In: *Sensors*, 22(4), 2022, pp. 1–23.

[3] HORST, Michael and CLEMONS, Benjamin. Evaluation and repair of tornado damage to a historic church. In: *Forensic Engineering: Performance of the Built Environment – Proceedings of the 7th Congress on Forensic Engineering*, 2015, pp. 387–397.

[4] FRANKL, Jiri. Wood-damaging fungi in truss structures of baroque churches. In: *Journal of Performance of Constructed Facilities*, 29(5), 2015, pp. 1–5.

[5] KLOIBER, Michal et al. Comparative evaluation of acoustic techniques for detection of damages in historical wood. In: *Journal of Cultural Heritage*, 20, 2016, pp. 622–631; LIÑÁN, Carmen Rodríguez et al. Application of non-destructive techniques in the inspection of wooden structures of protected buildings: The case of Nuestra Señora de los Dolores Church (Isla Cristina, Huelva). In: *International Journal of Architectural Heritage*, 9(3), 2014, pp. 324–340.

[6] EL-GAMAL, Rehab et al. The use of chitosan in protecting wooden artifacts from damage by mold fungi. In: *Electronic Journal of Biotechnology*, 24, 2016, pp. 70–78.

[7] MOUADDIB, El Mustapha et al. 2D/3D data fusion for the comparative analysis of the vaults of Notre-Dame de Paris before and after the fire. In: *Journal of Cultural Heritage*, 65, 2024, p. 221–231.

[8] BEDNARZ, Łukasz et al. Analysis of the condition of damaged vaults after a construction disaster in a historic church. In: *Key Engineering Materials*, 817, 2019, p. 613–620.

[9] LAMBERT, Simon and ROCKWELL, Cynthia (Eds.). *Protecting cultural heritage in times of conflict: Contributions from the participants of the International Course on First Aid to Cultural Heritage in Times of Conflict*. ICCROM, Roma, Italy, 2012.

[10] MATTES, Julia. *Die nordischen Stabkirchen*. AV Akademikerverlag, 2011.

[11] BUXTON, David. *Wooden churches of Eastern Europe. An introductory survey*. Cambridge University Press, 2008.

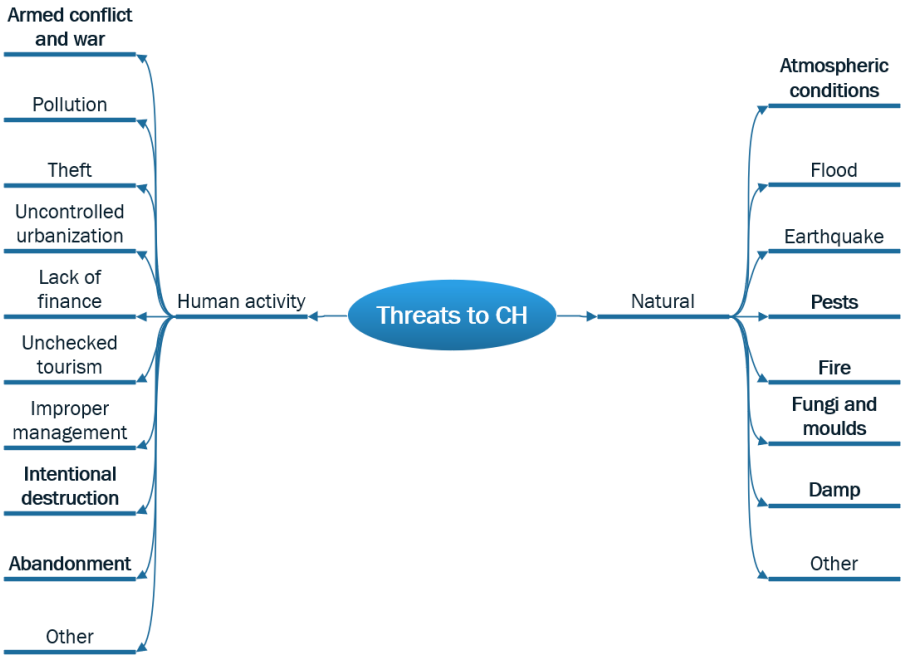

Fig. 1: *CH hazard classification. The most important threats in relation to wooden religious buildings are in bold.*

straw filling.[12] Unfortunately, many of the wooden churches were lost as a result of wars (mainly during World War I and II) and under communist rule, when renovations were forbidden and sacred wooden architectural monuments were even intentionally destroyed.[13]

Another significant threat to churches is the depopulation of many areas, which reduces the number of believers and leads to financial problems for many parishes. Contrary to appearance, the opposite trend – that is, a lack of financial problems and dynamically developing parishes – also pose a problem for wooden churches. When new brick church buildings are built, old wooden ones may become unnecessary and are abandoned or used as warehouses. Fires from natural, intentional or accidental causes, exacerbated by the poor technical condition of many such buildings, are also a significant problem. There are two such examples from Poland. The Catholic church of the Nativity of the Blessed Virgin Mary in the village of Libusza, dating from 1513, burned down on the night of 14 February 1986 (the sacristy and part of the walls survived). Rebuilt at the start of the twenty-first century, it burned down again on the night of 1 February 2016. It was subsequently removed from the list of monuments and will no longer be rebuilt.[14] The Orthodox Church of the Protection of Our Lady in the village of Komańcza, dating back to 1802, burned down completely on 13 September 2006 due to the inattention of the faithful lighting prayer candles at the iconostasis. It was rebuilt in 2008–2010.[15]

[12] TRUDYMASON, The largest wooden church in Europe and Książ Castle, Poland, https://trudymason.com/2019/09/07/the-largest-wooden-church-in-europe-and-ksiaz-castle-poland/

[13] MOSOARCA, Marius and GIONCU, Victor. Historical wooden churches from Banat Region, Romania. Damages: Modern consolidation solutions. In*: Journal of Cultural Heritage*, 14, 2013, pp. 45–59.

[14] Medieval heritage, Libusza – Church of the Nativity of the Blessed Virgin Mary, https://medievalheritage.eu/en/main-page/heritage/poland/libusza-church-of-the-nativity/

[15] Komańcza – Cerkiew Opieki Matki Boskiej – Świątynia 3D, https://swiatynia3d.pl/project/komancza-cerkiew/

It is possible to document the dimensions and appearance of these churches using modern 3D IT technologies: laser scanning – terrestrial laser scanning (TLS) and terrestrial short-range photogrammetry (TSRP).[16] Digitisation of these monuments' appearance (and size) facilitates scientific research and dissemination and can also, where necessary, aid reconstruction. It also supports conservation work.

Historical wooden churches are very difficult objects to scan. This is due to their shape (sharp roof angles to cope with heavy snowfall in the mountains), their significant height, and the building materials – old wood which reflects the laser beams poorly, exacerbated by the fact that they are often covered with moss and lichen, which disturbs the geometry of the buildings. Most churches are located in hard-to-reach areas on hills, often without access for ordinary cars or the possibility of using drones or booms.

The aim of the present research was to develop a methodology that combines the use of TLS and TSRP in challenging mountainous conditions, and to verify it during field expeditions to Romania. The article presents a review of the literature on the use of 3D digitisation of CH objects, along with examples of scanned wooden churches in Carpathian Region and details of attempts to document and protect them. It also presents the churches that were scanned as part of a scientific expedition by the Department of Computer Science, Lublin University of Technology in Romania (https://carpatia3d.com/en/pierwsza-karpacka-wyprawa/), problems related to them and a proposal for solving them. The workflow for 3D scanning historical wooden churches is shown in detail, as well as the results of its use, based on the example of the Orthodox church in Creaca.

2. Introduction

Wooden religious Christian buildings – including Roman Catholic, Orthodox and Greek Catholic churches – have survived in relatively large numbers throughout Carpathian Region. Despite numerous wars from the fourteenth to the twenty-first century – Tatar invasions in the first half of the eighteenth century; peasant rebellions and national liberation uprisings against the Turkish, Hungarian and Austrian authorities; World Wars I and II – and the destructive activities of the communist authorities in most Carpathian countries, objects of this type have survived to this day, albeit in varying states.[17] The scale of destruction of wooden objects can be traced in the Banat Mountains (southwestern part of modern Romania). In 1891 there were about 200 wooden Orthodox churches, in 1929 only 54, and by 1935 only 48 remained. Today, their number has decreased to 25 buildings.[18]

Wooden religious buildings in the broadly understood Carpathian Region are very diverse in terms of architectural form, and their appearance can be easily assigned to specific regions.

[16] ORTIZ, Pedro et al. Experiences about fusioning 3D digitalization techniques for cultural heritage documentation. In: *International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences – ISPRS Archives*, 36, 2006, pp. 224–229.

[17] BUXTON, *Wooden churches* …; PASCU, *Monumente Istorice* şi *de Arta Religioasa din Arhiepiscopia Vadului Feleacului* şi *Clujului*. Editata de Arhipiscopia Ortodoxă Română a Vadului, Feleacului şi Clujului, Cluj-Napoca, 1982; BRYKOWSKI, Ryszard. Łemkowska drewniana architektura cerkiewna w Polsce na Słowacji i Rusi Zakarpackiej. Wrocław: Ossolineum, 1986; KOVAČOVIČOVÁ-PUŠKAROVÁ, Blanka and PUŠKAR, Imrich. *Derev'jani cerkvi*. Bratislava: Muzeum ukrajinskiej kultury vo Svidniku, Slovenske Pedagogicke Nakladatelstvo, 1971; BRYKOWSKI, Ryszard. *Drewniana architektura cerkiewna na koronnych ziemiach Rzeczypospolitej*. Towarzystwo Opieki nad Zabytkami, 1995; UNESCO, Wooden Churches of the Slovak part of the Carpathian Mountain Area, https://whc.unesco.org/ru/list/1273

[18] MOSOARCA, Marius and GIONCU, Victor. Historical wooden churches ….

In Transylvania, Romania, the Maramureş-type church has been in use for almost six centuries (the name comes from the region located in the northern part of the country). Orthodox churches of this type are the subject of this article and are presented in Figure 2. What is important is that contemporary Romanian carpenters are successfully building such structures in the twenty-first century, to dimensions much larger than those of their great-grandfathers. The wooden church of the nunnery in the village of Săpânța has a tower 72 m high.[19]

In Poland, the most famous wooden Orthodox churches are Lemko churches (the Lemko people lived for centuries in the Low Beskids and the eastern part of the Sądecki Beskids until 1947, when they were forcibly deported to western and northern Poland as part of the Operation Vistula). Lemko churches are tripartite with separate roofs over the presbytery and the nave, and a tower with a pillar structure located above the women's gallery.[20] This type of church can also be found in Slovakia, adjacent to the Polish border.[21]

In the Carpathian foothills, tripartite Orthodox churches can be found with separate roofs topped with domes – the highest one above the nave – and a separate bell tower.[22] In modern Ukraine, one can find Boyko churches, which have highly elaborate roofs over the narthex, nave and presbytery, and also Hutsul churches – based on a Greek cross plan with a central dome.[23] Another type of wooden church in the Carpathian Region is the so-called Gothic Hungarian church, which has ridged roofs over the nave and presbytery and a tower with a pole structure added at the front of the body of the church with a characteristic room.[24]

Nowadays, thanks to 3D scanning, it has become possible to effectively transfer real objects representing cultural heritage into the digital world while maintaining information about their dimensions, shapes, existing colours, as well as documenting wear-and-tear or destruction.[25] This type of 3D digitisation can be applied to archaeological sites,[26] architectural objects[27] and

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[19] BUXTON, David. *Wooden churches* …; PASCU, Ştefan. *Monumente* ….

[20] BRYKOWSKI, Łemkowska drewniana …; BRYKOWSKI, *Drewniana architektura* ….

[21] UNESCO, Wooden Churches …

[22] BUXTON. *Wooden churches* ….

[23] KOVAČOVIČOVÁ-PUŠKAROVÁ and PUŠKAR, *Derev'jani cerkvi* ….

[24] WIERZEJSKA, Anna and MARKOWSKI, Wojciech. Laser scanning of the wooden church of the Assumption of the Blessed Virgin Mary and St Michael the Archangel in Haczów, Poland. In: *Protection of Culture Heritage*, 9, 2020, pp. 141–159.

[25] SILVA, Pinto da Fábio. *Usinagem de espumas de poliuretano e digitalização tridimensional para fabricação de assentos personalizados para pessoas com deficiência. Porto Alegre: Tese Doutorado – Curso de Engenharia, Minas, Metalúrgica e Materiais*. Universidade Federal do Rio Grande do Sul, Porto Alegre, 2011.

[26] LAMBERS, Karsten et al. Combining photogrammetry and laser scanning for the recording and modelling of the late intermediate period site of Pinchango Alto, Palpa, Peru. In: *Journal of Archaeological Science*, 34(10), 2007, pp. 1702–12; BRUNO, Fabio et al. From 3D reconstruction to virtual reality: A complete methodology for digital archaeological exhibition. In: *Journal of Cultural Heritage*, 11, 2010, pp. 42–49; NEAMTU, Calin et al. Methodology to create digital and virtual 3D artefacts in archaeology. In: *Journal of Ancient History and Archaeology*, 3, 2016, pp. 65–74; ARMSTRONG, B. J. et al. Terrestrial laser scanning and photogrammetry techniques for documenting fossil-bearing palaeokarst with an example from the Drimolen Palaeocave System, South Africa. In: *Archaeological Prospection*, 25(1), 2018, pp. 45–58; PEPE, Massimiliano et al. Scan to BIM for the digital management and representation in 3D GIS environment of cultural heritage site. In: *Journal of Cultural Heritage*, 50, 2021, pp. 115–125.

[27] WIERZEJSKA and MARKOWSKI, Laser scanning …; BASTONERO, Paola et al. Fusion of 3D models derived from TLS and image-based techniques for CH enhanced documentation. In: *ISPRS Annals of Photogrammetry, Remote Sensing and Spatial Information Sciences*, 2(5), 2014, pp. 73–80; MEDIUM, How 3D Scanning helps to preserve historical buildings; HERMAN, Grigore Vasile et al. 3D modeling of the cultural heritage: Between opportunity and necessity. In: *Journal of Applied Engineering Sciences*, 10(23), 2020, pp. 27–30; MIŁOSZ, Marek et al. 3D scanning and visualization of large monuments of Timurid architecture in Central Asia — A methodical approach. In: *Journal on*

small museum objects[28] including sculptures and statues.[29] Digital 3D copies are often made available to the public via virtual museums,[30] Internet portals[31] or even via 3D copies created using 3D printers.[32]

Computing and Cultural Heritage, 14(1), 2021, pp. 1–31; OOSTWEGEL, L.J.N. et al. Digitalization of culturally significant buildings: Ensuring high-quality data exchanges in the heritage domain using OpenBIM. In: *Heritage Science*, 10(10), 2022, pp. 1–14. TYSIAC, Pawel et al. Combination of terrestrial laser scanning and UAV photogrammetry for 3D modelling and degradation assessment of heritage building based on a lighting analysis: Case study—St. Adalbert Church in Gdansk, Poland. In: *Heritage Science*, 11(53), 2023, pp. 1–14; MAŁYSZEK, Hubert Aleksander et al. The case study of using photogrammetric systems and laser scanning for three-dimensional modeling of cultural heritage sites. In: *Advances in Science and Technology Research Journal*, 17(6), 2023, pp. 345–357; CACIORA, Tudor et al. Digitization of the built cultural heritage: An integrated methodology for preservation and accessibilization of an art nouveau museum. In: *Remote Sensing*, 15, 2023, pp. 1–25; KĘSIK, Jacek et al. A methodical approach to 3D scanning of heritage objects being under continuous display. In: *Applied Sciences*, 13(1), 2023, pp. 1–20.

[28] KIM, S. H. et al. A study on convergence modeling of cultural artifact using x-ray computed tomography and three-dimensional scanning technologies. In: *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, 48(2), 2023, pp. 851–856; MERELLA, Marco et al. Structured-light 3D scanning as a tool for creating a digital collection of modern and fossil cetacean skeletons (Natural History Museum, University of Pisa). In: *Heritage*, 6, 2023, pp. 6762–6776. MOUSSA, Wassim. *Integration of digital photogrammetry and terrestrial laser scanning for cultural heritage data recording*. Doctoral dissertation, University of Stuttgart, Stuttgart, Germany, 2014.

[29] RUIZ, Rafael Melendreras et al. Comparative analysis between the main 3D scanning techniques: photogrammetry, terrestrial laser scanner, and structured light scanner in religious imagery: The case of The Holy Christ of the Blood. In: *ACM Journal on Computing and Cultural Heritage*, 15(1), 2021, pp. 1–23; CALVO-SERRANO, María Araceli et al. Historical-graphical analysis and digital preservation of cultural heritage: Case study of the baptismal font of the church of Santiago Apóstol in Montilla (Córdoba, Spain). In: *Heritage Science*, 10(149), 2022, pp. 1–14; GHERARDINI, Francesco and SIROCCHI, Simone. Systematic integration of 2D and 3D sources for the virtual reconstruction of lost heritage artefacts: The equestrian monument of Francesco III d'Este (1774–1796, Modena, Italy). In: *Heritage Science*, 10(96), 2022, pp. 1–19; NEAMTU, Calin et al. Component materials, 3D digital restoration, and documentation of the imperial gates from the wooden church of Voivodeni, Sălaj County, Romania. In: *Applied Sciences*, 11(8), 2021, pp. 1–18.

[30] BARSZCZ, Marcin et al. 3D scanning digital models for virtual museums. In: *Computer Animation and Virtual Worlds*, 34, 2023, pp. 1–12; ŻYŁA, Kamil et al. VR technologies as an extension to the museum exhibition: A case study of the Silk Road museums in Samarkand. In: *Muzeologia a Kulturne Dedicstvo*, 8(4), 2020, pp. 73–93; LEE, Woo-Hee et al. Students' reactions to virtual geological field trip to Baengnyeong Island, South Korea. In: ISPRS International Journal of Geo-Information, 10, 2021, pp. 1–13; SURYANI, Mira et al. Development of historical learning media based on virtual reality of The National Awakening Museum. In: *Jurnal Ilmiah Bidang Teknologi Informasi dan Komunikasi*, 7(2), 2022, pp. 125–131.

[31] Wooden monuments of the Carpathians in 3D, https://carpatia3d.com; 3D Digital Silk Road portal, https://silkroad3d.com; BARBIERI, Loris et al. Virtual museum system evaluation through user studies. *Journal of Cultural Heritage*, 26, 2017, pp. 101–108; CACIORA, Tudor et al. The use of virtual reality to promote sustainable tourism: A case study of wooden churches historical monuments from Romania. In: *Remote Sensing*, 13(9), 2021, pp. 1–22; POUX, Florent et al. Initial user-centered design of a virtual reality heritage system: Applications for digital tourism. In: *Remote Sensing*, 12(16), 2020, pp. 1–32.

[32] HEVKO, Ihor et al. Methods building and printing 3D models historical architectural objects. In: SHS Web of Conferences, 75, 2020, pp. 1–6; PARSINEJAD, Hossein et al. Production of Iranian architectural assets for representation in museums: Theme of museum-based digital twin. In: Body Space & Technology, 20(1), 2021, pp. 61–74; MONTUSIEWICZ, Jerzy and MIŁOSZ, Marek. Architectural Jewels of Lublin: A modern computerized board game in cultural heritage education. In: Journal on Computing and Cultural Heritage, 14(3), 2021, pp. 1–21; DONG, Qianli et al. 3D scanning, modeling, and printing of Chinese classical garden rockeries: Zhanyuan's south rockery. In: Heritage Science, 8(1), 2020, pp. 1–15; VERNIZZI, C. and GHIRETTI, A. Methodologies capture three-dimensional high-definition of sixteenth wooden frames. The case of works by Correggio. In: International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences – ISPRS Archives, 38, 2009, pp. 1–8.

In recent years, thanks to the enormous progress in digital photography and software, several studies have been published on practical methods for integrating the TLS and TSRP.[33] Some interesting activities related to Romania were described by Caciora et al.,[34] who created a digital 3D model of the Darvas-La Roche House (Oradea) by integrating TLS, TSRP and SRAP (short range airborne photogrammetry) technologies using an unmanned aerial vehicle (UAV).

A literature review revealed that 3D scanning of wooden architectural objects is very rare.[35] In the case of the churches studied for this article, this is in part due to the fact that they occur in the difficult mountainous terrain in the Carpathian Region and are not on the radar of scientists from Western countries

3. Materials and methods

3.1. Historic wooden churches of Romania

The works presented in the article concern four wooden churches in Romania's Carpathian Region (Figure 2 and 3):

- The Orthodox Church of Saint Archangels Michael and Gabriel in Păniceni.
- The Orthodox Church of Saint Nicholas in Creaca.
- The Orthodox Church of Saint Archangels Michael and Gabriel in the village of Târguşor.
- The Orthodox Church of Holy Hierarch Nicholas in the village of Păusa.

Orthodox church of Saint Archangels Michael and Gabriel in Păniceni

The wooden church in the village of Păniceni (Cluj province) was built in 1730 and is located on a hill in the village (monument under the LMI code: CJ-II-m-B-07734; LMI – Lista Monumentelor Istorice, ang. list of historical monuments)[36] in an east–west orientation (Figure 2A). The church was built of oak beams connected in dovetail fashion, on a rectangular plan with the following dimensions: pronaos 2.90 m x 5 m; main nave 5.50 m x 5 m; and presbytery on the eastern side with cut corners 3.10 m x 3.70 m. The building is covered with a ridged roof and on the south side there is a porch added during renovations in the nineteenth century. A tower resting on a pillar structure sits above the pronaos. It has a distinct room (overhanging storey) and a hipped roof with a square base decorated with four turrets (one at each corner) which tapers into a slender cone as it ascends. The interior of the church is decorated with paintings made by Dimitrie Ispas from Gilău in 1809.[37]

Orthodox Church of Saint Nicholas in Creaca

The wooden Orthodox church from Creaca is located in the centre of the town of the same name (Sălaj district), in an east–west orientation (Figure 2B). It was probably built in the eighteenth century but there are no written materials on this subject (monument code LMI: SJ-

[33] BASTONERO et al., Fusion of …, 2014, pp. 73–80; WU, Bo and TANG, Shengjun. Review of geometric fusion of remote sensing imagery and laser scanning data. In: *International Journal of Image and Data Fusion*, 6(2), 2015, pp. 97–114.

[34] CACIORA et al., Digitization …, 2023, pp. 1–25.

[35] Komańcza – Cerkiew Opieki Matki Boskiej …; WIERZEJSKA and MARKOWSKI, Laser scanning …, 2020, pp. 141–159; BASTONERO, et al., Fusion of …, 2014, p. 73–80; HERMAN et al., 3D modeling …, 2020, pp. 27–30.

[36] Ministerul Culturii, Lista monumentelor istorice, http://www.cultura.ro/lista-monumentelor-istorice

[37] CÎMPIAN, Felicia Elena. *Bisericile de lemn din zonele Călatei, Gilăului, Hăşdatelor* şi *Clujului. Aspecte istorico-etnografice* şi *arhitectură tradiţională.* Cluj Napoca, 2002.

Fig. 2: *Appearance of the Marmures-type wooden churches analysed: (A) Saint Archangels Michael and Gabriel in the village of Păniceni, (B) Saint Nicholas in Creaca, (C) Saints Archangels Michael and Gabriel in the village of Târguşor, (D) Saint Nicholas in the village of Păusa.*

II-m-A-05044).[38] According to locals, the church was moved twice. The interior wall painting is attributed to the painter Ioan Pop from Românași. The church only has a window on the south side, where there is an almost completely erased external wall painting. The eaves are located

[38] Ministerul Culturii, Lista monumentelor …

on the north side and strongly connected to the top of the structure. A tower with a pillar structure is located above the pronaos with a slightly marked room and a slender hipped roof. The church underwent restoration in 1972 and 1998.[39]

Orthodox Church of Saint Archangels Michael and Gabriel in the village of Târgușor

The wooden church in Târgușor (Sânmartin commune, Cluj province) dates back to the seventeenth century and is one of the oldest buildings of this type in Romania. Located on the slope of a small hill, it is surrounded by a cemetery (monument code LMI CJ-II-m-B-07779).[40] The structure does not stand out for its beauty, especially since the wooden oak logs of its walls were plastered and painted salmon-colour, causing the building to lose its historic character (Figure 2C). The damaged shingles of the ridged roof were replaced with new ones several years ago. It has a relatively low tower without a room, covered with a hipped roof. Currently, no liturgy is held in the facility. The interior contains historic carved decorations and the barrel vault is decorated with a keystone formed from a carved beam. A few traces of paintings have survived on the vault of the main nave and in the altar. In the early twentieth century, a layer of canvas was glued to an old painting on which scenes inspired by the Bible were reproduced.[41]

Orthodox Church of the Holy Hierarch Nicholas in the village of Păusa

The wooden church in Păușa (Sălaj district) dates back to 1730 (monument under the LMI code: SJ-II-m-A-05092).[42] The church was built on a rectangular plan, with a recessed, five-sided apse, covered with a ridge roof (Figure 2D). Above the women's gallery there is an impressive tower with a column structure and a slightly marked room covered with a hipped roof which tapers into an extremely slender cone. The external walls are decorated with a rope motif carved into the beams. The entrance door frames are richly decorated with rosettes, rope motifs (so-called ropes), and geometric motifs. The door frames leading from the women's gallery to the main nave are decorated with rope borders, geometric patterns and spiral rosettes. External paintings have been preserved on fragments of the walls showing scenes from the New Testament, such as the Assumption of the Virgin Mary or Mary surrounded by the Apostles. The church was restored in 1966–1968.[43]

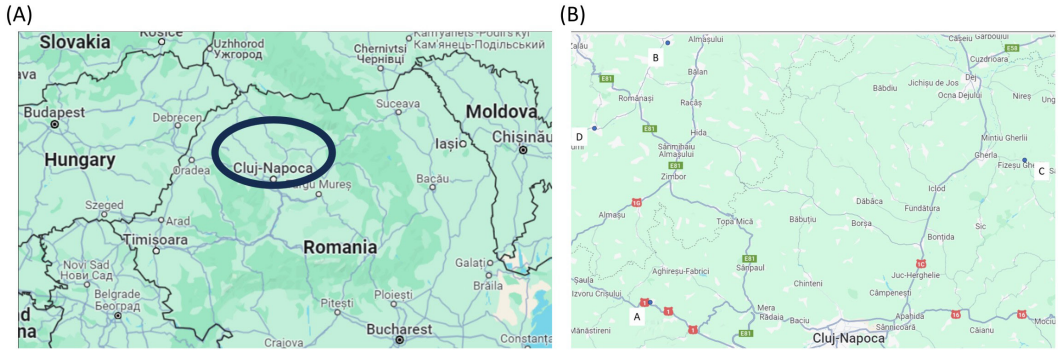

Fig. 3: *Location of the wooden churches analysed: A – area of the location of wooden churches, B – location of the scanned churches* – markings as in Fig. 2.

[39] GODEA, Ioan. *Biserici de lemn din România (nord-vestul Transilvaniei)*. București: Editura Meridiane, 1996.
[40] Ministerul Culturii, Lista monumentelor …
[41] CÎMPIAN, *Bisericile de lemn* ….
[42] Ministerul Culturii, Lista monumentelor ….
[43] CRISTACHE-PANAIT, Ioana. Bisericile de lemn din Sălaj. In: *Buletinul Monumentelor Istorice*, 1, 1971, pp. 31–40.

3.2. Problems and possible solutions

When carrying out 3D scanning of wooden religious buildings in Carpathian Region, the generally proven TLS technology was selected as the basis due to its high accuracy. This technology, like any other, has limitations that become important in the context of the specific appearance and location of the objects being scanned.

The purpose of 3D scanning in this case was to obtain the most complete representation of the external shape of the object. The typical shape of a church building, presented schematically in Figure 4, consists of cuboid shapes (the widest one forming the nave, the narrower one forming the gallery and the presbytery, with sharp corners or a rounded apse in the case of the presbytery) covered with a ridged roof (with a steep angle of inclination), usually covered with wooden shingles (or, less often, sheet metal). Above the section known as the women's gallery, there is usually a slender, medium-height tower, usually covered with four or eight sloping roof faces. The overall height of the object is usually under 20 m, although in northern Romania (Maramureş) it often exceeds 30 m.

The manner in which points in space are registered by the TLS scanner is based on analysis of the laser beam sent from the device and reflected from the surface of the object. In order for a given point on the object's surface to be correctly measured by the scanner, the following conditions must be met:

1. There must be a straight path between the scanner and the measured point that is clear of any obstacles obstructing the laser beam.
2. The point to be measured must be no further from the scanner than its maximum measurement range.
3. The power of the laser light reflected towards the scanner must be not less than the minimum recorded by the scanner's receiver. The rebound power depends on two factors:

- The reflective (albedo) properties of the object's surfaces at that point (lower albedo means a smaller percentage of incident light is reflected).
- The angle at which the laser beam hits the surface of the object at this point (according to Lambert's cosine law,[44] the maximum reflection is recorded by the scanner when the laser hits the surface perpendicularly and decreases with the cosine of the angle of deviation from this direction).

The second aspect of the TLS scanner's operation is that the measurement of the distance to the reflection of the laser beam is not performed continuously while the scanner (and the mirror) rotates. A sampled measurement is performed with a shift by a constant angle, because the number of measurements during one revolution is finite and constant. Therefore, the density of samples read on a given surface of the object depends on the scanner's distance from this place and decreases with its square. Therefore, during scanning, it is necessary to select the distance and operating parameters of the scanner in such a way that the sampling density of a given surface of the object is sufficient to reproduce it in a satisfactory manner.

Another not insignificant factor is the vegetation: trees and bushes growing around the structure. Vegetation is a significant impediment to TLS scanning. In certain cases, it also prevents photographing the object. It is usually not possible to remove shrubs or trees before scanning the target.

The above discussion shows that optimal scanning of the external body of an object requires the possibility of establishing a set of TLS scanner positions such that for each external surface

[44] What is Lambert's Cosine Law? https://www.gophotonics.com/community/what-is-lambert-s-cosine-law

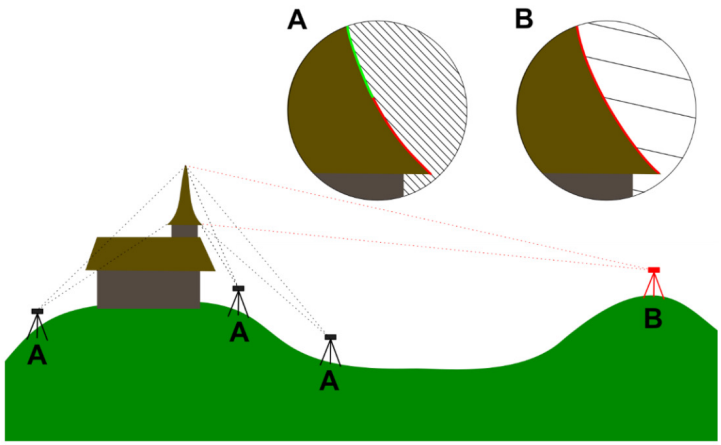

Fig. 4: *Illustration of the problems of scanning historic wooden churches in mountainous areas. A – scanner positions that are useful but do not provide visibility of the surface of higher parts of the object (marked in red) due to too sharp an angle of incidence of the laser beam. B – scanner positions unusable due to too great a distance or too low a density of scanning points.*

of the object there is a scanner position that ensures the appropriate distance and angle of incidence (preferably perpendicular to the scanned surface) of the laser beam.

In the case of the objects discussed, the possible area in which the scanner can be placed is often additionally limited due to the mountainous terrain. Using scaffolding or elevators to place the scanner close and high enough to obtain accurate scans of missing surfaces is a time-consuming, expensive and often impossible operation due to conditions specific to this type of building (lack of access, steep terrain, bodies of water, no permission to bring heavy equipment into the church cemetery, etc.).

The structure of the church itself does not allow the building itself to be used to place the scanner on a higher level. For example, attempts to use the tower would be very limited due to its small interior and the view being significantly obscured by structural elements. Nor would using this space make it possible to scan the roof, the area which commonly presents the most serious and numerous problems and deficiencies.

Possible countermeasures have been suggested:

1. Using unmanned laser scanning (ULS).
2. Using terrestrial short-range photogrammetry (TSRP).

The first method involves mounting a laser scanner on a drone that can move through the air around the scanned object. This would allow the scanner to be placed optimally in relation to the object. Despite the slightly lower accuracy compared to terrestrial options, it would still be sufficient to obtain a satisfactorily accurate representation of the shape of the surface of the scanned object.[45]

This proposal, however, has two significant drawbacks. The first is a significant increase in the cost of the scanning equipment. The second, much more important one is the existence of

[45] RIEGL Laser Measurement Systems GmbH. Unmanned Laser Scanning, http://www.riegl.com/products/unmanned-scanning/; Leica Geosystems. Leica BLK2FLY Autonomous Flying Laser Scanner, https://leica-geosystems.com/en-gb/products/laser-scanners/autonomous-reality-capture/blk2fly

regulations prohibiting the use of UAVs without time-consuming procurement of appropriate permits.

The second method is based on filling in the gaps left using the TSRP method, which reproduces the shape of a 3D surface based on a series of 2D photos. The accuracy of this method depends on the cameras used and the method and number of source photos. However, it does obtain a satisfactory level of detail of the surface's appearance. The main disadvantage of photogrammetry – a lack of knowledge of the scale (i.e., the size) of the obtained model – is in this case eliminated by matching it to the scale of the model created from TLS scans.

UAVs are also used in photogrammetry, but their use was rejected due to legal restrictions. In this case, however, it is possible to use other solutions that do not require the use of heavy equipment or scaffolding.

Carrying out a TLS measurement requires maintaining a stable position throughout a measurement period ranging from a few to several dozen minutes. If it is necessary to lift the scanner one must build a stable base (Figure 5A). Taking a photo takes a fraction of a second and the camera weighs no more than 1 kg. It is therefore possible to use simple hand-held booms (monopods) to place the camera in a position that ensures proper coverage of a surface not visible from the ground (Figure 5B).

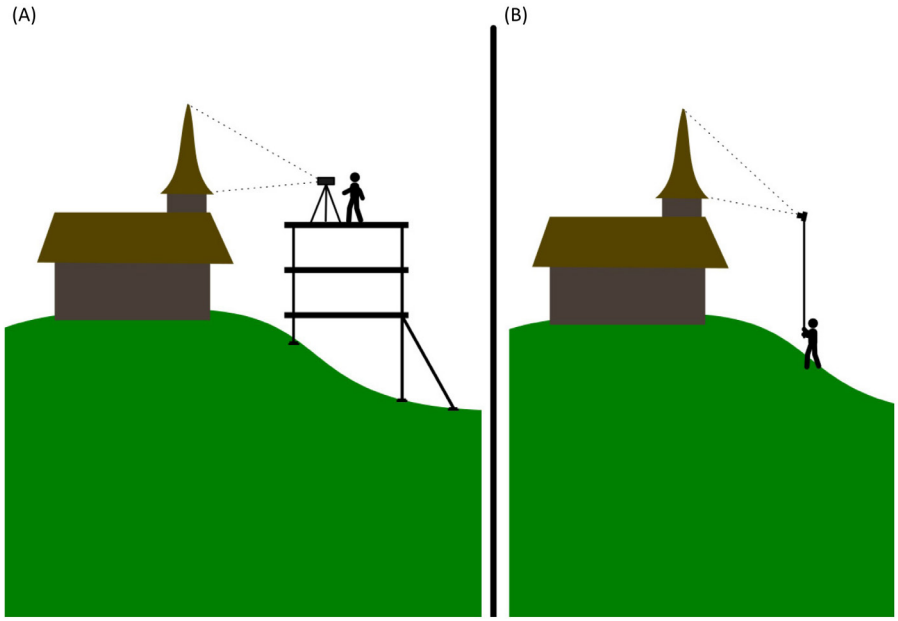

Fig. 5: *Illustration of how to place the recording device at the required height. A – in the case of a TLS scanner; B – in the case of taking photos for photogrammetry.*

Additionally, classic photos used in photogrammetry technology are based on ambient light reaching the lens. Depending on the settings, it is possible to record surfaces that cannot be recorded by a TLS scanner placed in the same position due to the inclination of the slope and/or low albedo. As a result, even photos taken from ground level should make it possible to at least partially fill in the gaps.

In summary, the use of TLS scanning using only basic tripods and photogrammetry based on photos taken using simple methods (manual, tripod, monopod, zoom from a hill) should be sufficient to obtain a representation of the external shape of the object with a satisfactory level of detail.

3.3. Methods

In order to meet the requirements of scanning in difficult terrain, presented in the previous chapters, it was decided to develop an original methodology of organisation, scanning and post-processing as well as dissemination of results. The methodology defines, among other things, a workflow for 3D scanning of historical wooden churches (Figure 6). It draws upon experiences the author team gained during previous digitisation works in Asia and Europe.[46] Due to the challenges of conducting fieldwork in the chosen terrain, emphasis was placed on the simplicity and self-sufficiency of digitisation tools. This led to the development of a methodology with a wide range of applications and a low cost that nevertheless obtained results of the requisite quality.

Due to the complexity of the problem, the methodology (Figure 6) was implemented in three parts: preliminary planning activities (at home), acquisition and initial validation of 3D data (in situ) and post-processing of the collected data (at home).

The first part of the methodology involves preliminary planning activities ("Initial planning" activity) related to the selection of objects for 3D scanning and the dates on which the scanning process can take place. It also takes into account the specific features of the area, the local climatic conditions, time of year (e.g., lack of leaves on trees and bushes), and organisational and legal issues related to access to the facility, as well as the selection of appropriate equipment. Documentation relating to the facility is collected, including historical documentation. The result is a plan for a scientific expedition.

The next part of the methodology is carried out in the field in the vicinity of the scanned object. During the "In situ planning" activity, the fieldwork plan is adapted to the conditions on the ground. It is determined which elements (areas, parts) of the object will be scanned using which specific techniques. The initial positions of the equipment, its settings, the number of repetitions, and areas of the facility requiring special attention are determined. Problematic scanning steps, as well as likely countermeasures, are identified. Again, the result is a modified in-situ activity plan.

After completing the "In situ planning" activity, digitisation activities begin. They are implemented in parallel and carried out such that they do not interfere with each other. They are also repeated many times until the assumed requirements are met, that is, when it can be concluded that sufficient data has been collected to satisfactorily reproduce the object in 3D space.

The "TLS scanning" activity involves using a scanner based on laser light to obtain a coloured cloud of points in 3D space. This map is usually saved in the proprietary format of the company that made the 3D scanner. This means that the initial verification of the quality and completeness of the scan ("Initial verification") is performed using proprietary software dedicated to the scanner used.

At the same time, photos of the object are taken for 3D scanning ("Taking photos" activity). Areas designated during the "In situ planning" activity are photographed, with emphasis on

[46] MIŁOSZ et al., 3D scanning …; KĘSIK et al., A methodical approach ….

areas of the object that were problematic for the 3D scanner. Thanks to this, areas of the 3D model of the object that were not possible to be acquire correctly with a 3D scanner can be supplemented by elements of the 3D model obtained using photogrammetry. The photos are saved in RAW or JPG format.

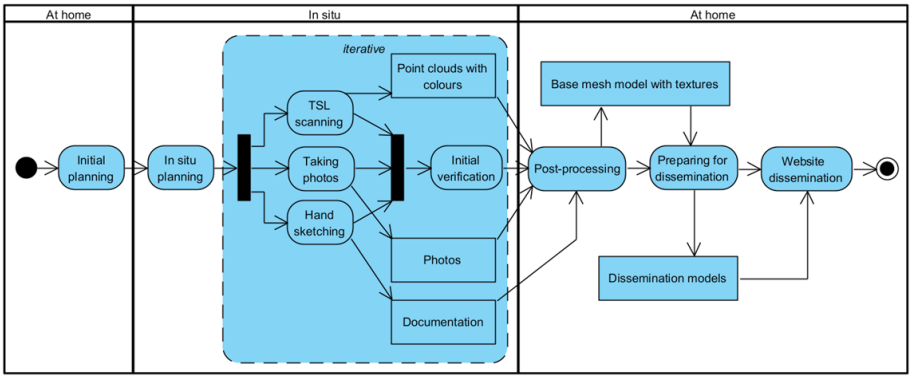

Fig. 6: *Workflow for 3D scanning of historical wooden churches.*

As part of the "Hand sketching" activity, documentation is created including a diagram of the entire object, as well as individual diagrams of important selected areas. The diagrams include information about the actual positions of the equipment and its specific settings. This documentation can be additionally supplemented by in situ historical and architectural data about the facility.

The aim of the "Initial verification" activity is to verify the currently held data in terms of quality and completeness. As a result, it may lead to a decision to rescan or photograph certain areas of the object that were not scanned well enough.

Data collected during fieldwork are then post-processed ("Post-processing" activity). This is a time-consuming activity and requires efficient computer equipment, so it is not carried out in the field. Post-processing begins with cleaning and aligning the cloud points acquired through TLS scanning. This phase is performed using the scanner's dedicated software, which may have certain limitations. Therefore, it is recommended to use the program Reality Capture, to which point clouds can be imported, for example, in PTX format. The photos are then imported and matched to the imported point clouds. The next step is to select photos that can be used to recreate the areas of the scan that are missing or of poor quality. Then a base mesh model is generated. It is covered with textures based on selected photos and colour information about individual points recorded by the 3D scanner. As a result of post-processing, a base mesh model with textures is created that is characterised by high accuracy of object mapping, but also has a large file size. Such models can be saved in OBJ or GLB format.

In order to disseminate the obtained base mesh model, it must be adapted to the specificity of the end devices that will be used to present it. Typically, these devices (e.g. VR headsets) are unable to efficiently process such a model. Therefore, the "Preparing for dissemination" activity involves producing simplified 3D models (dissemination models) and tailoring them to the capacity of end devices. These models require re-texturing, after which they can be saved in OBJ or GLB format.

The "Website dissemination" activity involves placing a dissemination model on a website. As a result, users can interact with the model (cultural heritage) without needing to install

specialised software. Another advantage is that this enables use of highly effective content dissemination techniques typical of the Internet, such as social media.[47]

3.4. Hardware and software

A FARO Focus S 350 scanner and a NIKON D5300 digital SLR camera were used for data acquisition (Table 1). All computations were performed on the laptop computer equipped with an Intel i9 processor (8 cores), 64 GB RAM, nVidia RTX 2080m graphics, and SSD M2 disk drive, Windows 11 operating system. 3D data were processed in SCENE and Reality Capture software (Table 2).

Tab. 1: *Data acquisition equipment used in the digitisation process*

Hardware	TLS 3D scanner	Digital SLR camera
Model	Faro Focus S 350	Nikon D5300
Main parameters	• Range 0.6 – 330.0 m • Distance measurement error ±1 mm • 70 Mpix colour photo module with automatic brightness adjustment • 305° vertical and 360° horizontal field of view • Class I laser with a wavelength of 1.550 nm	• Nikkor lens with a focal length of 18–140 mm • Nikkor lens with a focus length of 70–300 mm • Matrix CMOS 24 Mpix APS-C • Max resolution 6,000 x 4,000
Main settings	• Point resolution 10240 pts/360° • Noise reduction 4x • Colour: even weighted HDR	• exposure time: 1/320–1/4000 s • focal length: 18–155 mm • maximum relative aperture: 7.1–9.0
Procedure notes	• Scans taken from a tripod from various distances and angles • Coverage of adjacent scans at least 40%	• Photos taken without a tripod from various distances and angles • Both lenses have the option to turn on vibration compensation • Coverage of adjacent photos at least 60%

Tab. 2: *Software used in the digitisation process*

Program name	Faro SCENE v. 2019	Reality Capture 1.3
Purpose of the program	Point cloud alignment and export	Overlaying photos on aligned point clouds Generating a base mesh model Generating dissemination models Texturing 3D models
Data formats used	PTX – for storing the point cloud	OBJ, GLB – for storing the 3D model

[47] PEI, Jin and YI, Liu. Fluid space: Digitisation of cultural heritage and its media dissemination. In: *Telematics and Informatics Reports*, 8, 2022, pp. 1–10.

4. Results

4.1. Obtained models

Figure 7 shows models of four wooden churches obtained in the post-processing process in accordance with the methodology set out in the previous section (Figure 6.).

Most of the models in Figure 7 are available in the form of dissemination models on the website http://carpatia3d.com.

Fig. 7: *Appearance of the obtained base mesh models with the texture of the studied churches: (A) Saint Archangels Michael and Gabriel in the village of Păniceni, (B) Saint Nicholas in Creaca, (C) Saint Archangels Michael and Gabriel in the village of Târguşor, (D) Saint Nicholas in the village of Păusa.*

4.2. Analysis of the scanning results of the historical wooden church in Creaca

A wooden historic church from Creaca is presented as an example of scanning, post-processing and its results. The parameters of the data obtained during in situ scanning are presented in Table 3.

Tab. 3: *Parameters of the obtained and processed church data in Creaca.*

	Unit	Quantity
Number of TLS scans	–	13
TLS scan resolution	pts/360°	10,240
Raw data size (scans)	GB	3.95
Number of photos taken:	–	147
Photo format	–	JPG
Photo resolution	px	6000 x 4000
Size of raw data (images)	GB	0.98
Number of photos used	–	141
Resulting point cloud (TLS)	Million pts	155.7
Base mesh model (TLS + Photogrammetry)	Million triangles	39.9

The location of the scanner placement points in the field during the digitisation of the church in Creaca is shown in Figure 8A. The church was scanned from 13 possible positions. The scanning was complemented by 141 photos of the object taken both from close up and from accessible hills (Figure 8B).

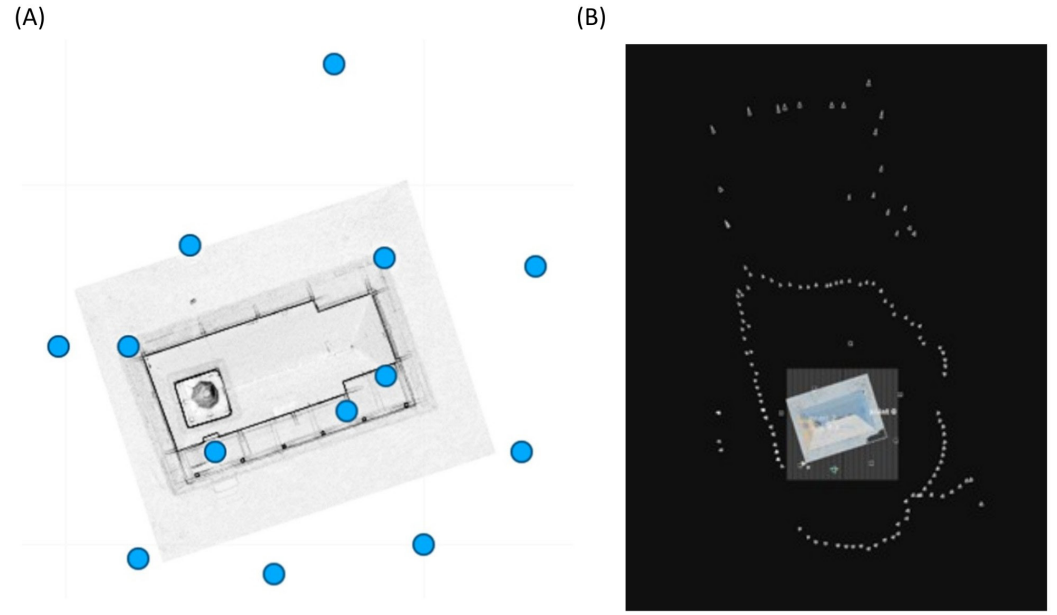

Fig. 8: *TLS scanning points of the church in Creaca (A) and places where photos of the object were taken (B).*

In the process of registering and combining the TLS scans, an integrated point cloud of the scanned object was obtained. It shows deficiencies in the roof covering resulting from the limitations of TLS scanning mentioned in section 3.2. Figure 9 shows areas of the cloud containing discontinuities (A) and the resulting distortions of the triangle mesh generated (in Reality Capture 1.3 software) (B).

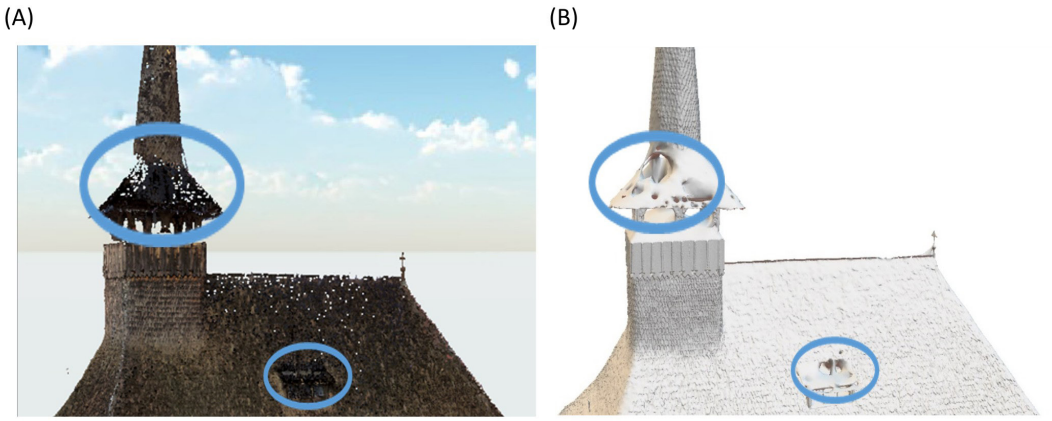

Fig. 9: *Cloud of coloured points (A) and mesh model (B) of the church in Creaca developed using TLS data.*

Using photos to build a mesh model makes it more accurate. Due to the fact that, as seen in Figure 10A, the point cloud obtained using TLS had quite large areas without points (so-called "holes", marked with ovals), the generated mesh model in this area was highly inaccurate – resulting in the very large triangles visible in Figure 10B. After incorporating the photos and combining them with the TLS data, these areas were generated much more accurately, as seen in Figure 10C.

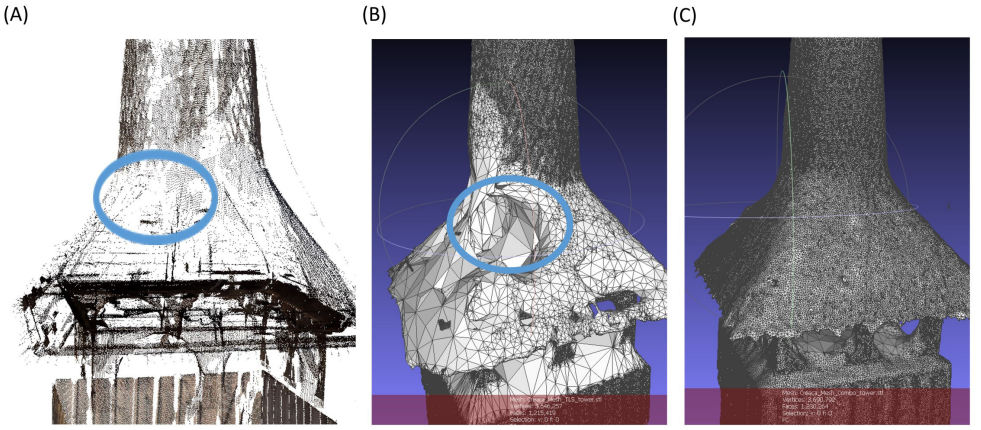

Fig. 10: *Results of completing the mesh model using photogrammetry. A – approximation of the turret: cloud of coloured points obtained from TSL, B – mesh model from TSL data, C – mesh model obtained by the described method with TLS and photogrammetry data. Areas with large missing points and model inaccuracies are indicated with ellipses.*

5. Discussion

3D digitisation of wooden religious monuments is rarely undertaken by scientific communities due to the fact that they tend to occur across a limited geographical region (for example, in the Carpathian Region) and the practical difficulties of accessing them. Therefore, developing a methodology that is effective in typical mountainous field situations is very important. Previous publications have not dealt with this issue.

Generating 3D mesh models of scanned Orthodox churches using only TLS data obtained from the ground level does not guarantee a sufficiently good quality model due to limited access to the object and its specific geometry. The digital model presented by Wierzejska and Markowski (2020)[48] was a cloud model which to some extent masks the deficiencies in the information obtained about the scanned surfaces.

Supplementing the TLS data with a set of photos of the scanned object and introducing a hybrid approach to generating a 3D mesh model of the church's body which enhanced data from the 3D scans with data from the photographs allowed us to create a 3D model with the characteristics of a realistic model. Therefore, we can state that the effectiveness of this approach, which has already been confirmed for stone architectural objects,[49] is also satisfactory in the case of wooden objects discussed in this article.

6. Conclusion

This article presents a methodology for data acquisition activities to generate digital 3D models of wooden architectural heritage using a TLS scanner and TSRP with a SLR camera equipped with two lenses with variable focal lengths. The results allow us to formulate several conclusions.

(i) Data acquisition using the TLS method, using appropriate process parameters, can be used for effective 3D scanning of a wooden structure, such as an Orthodox church, capturing complex architectural structures such as steep roofs of various heights, soaring, slender towers with chambers, and arcades with supports in the form of columns.

(ii) Due to the difficulty involved in accessing objects located in hard-to-reach mountainous regions, it is important to select 3D digitisation parameters in such a way that the required number of scans (usually 2–3 dozen) can be performed within a few hours and in situations where natural lighting is appropriate.

(iii) Photographic documentation using two lenses with different focal ranges enables capture of many additional photos from different perspectives and distances from the object, which can be used to complement the scan data and map textures onto the model. This choice of equipment partly contradicts the commonly held views that a lens with a fixed focal length should be used for photogrammetry, and that photos should be taken at one focal length when using lenses with a zoom function.

(iv) Reality Capture software (version 1.3) is a highly effective tool for building models that combine data from TSL and photographic images. Modern software facilitates the synthesis of data from TSL and photogrammetry.

(v) The 3D mesh models generated by our methodology provide a basis for preparing dissemination versions of the models that can be printed on 3D replicators. This means they

[48] WIERZEJSKA, Anna and MARKOWSKI, Wojciech. Laser scanning …, 2020, pp. 141–159.

[49] TYSIAC, Pawel et al. Combination of terrestrial laser scanning …, 2023, pp. 1–14; MAŁYSZEK, Hubert Aleksander et al. The case study of using photogrammetric ..., 2023, pp. 345–357.

can be made available in the form of scaled copies, which could be of benefit to people with visual impairments, among others.

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