Università
Ca'Foscari
Venezia

Master's Degree

in Conservation Science and Technology for Cultural Heritage

Final Thesis

Virtual Restoration Proposals for the Basilica of Santa Maria Assunta in Torcello

Supervisor
Ch. Prof. Diego Calaon

Assistant supervisor
Ch. Prof. Elisabetta Zendri

Assistant supervisor
Ch. Prof. Stefano Riccioni

Graduand
Jovan Dordevic
Matricolation
number 880137

Academic Year
2020 / 2021

Master's Thesis Abstract

One of the recent developments in the digital domain is its application to the preservation and presentation of cultural heritage. Although a lot has been done on describing and improving the technical aspect of it, insufficient attention has been given to its theoretical aspect. Especially to the part that concerns the relation between the practical philosophical and ethical postulates of contemporary conservation and restoration practice and the sphere of digital restoration. Therefore, the aim of this paper is to present, examine, and offer a possible understanding of the theory of digital restoration, as well as its relation to its practical counterpart. The case study on which the whole research is applied is the basilica of Santa Maria Assunta on the island of Torcello, located in the northern part of the Venetian lagoon.

After presenting a brief history of the church itself, the thesis is developed towards the presentation and examination of the 'Brandian' postulates and their applicability in complex cases i.e. multilayered frescoes. The next step is to present and understand how the digital approach to restoration functions; to examine its pros and cons. This is further explained in comparison with the practical (Brandian) approach. By doing this, my aim is to stress the good potential that digital restoration has, especially in the field of presentation, communication, and education of the public regarding cultural heritage.

The second part of the thesis is dedicated to the application of the ideas and postulates presented in the previous part to the specific case studies. The first one is the problem of two strata (a mosaic decoration placed over a fresco) and solving the complex issue of recreating a historical setting such as the interior of the apse from the 12th century. I will propose a few visual solutions for this problem that can be used for creating digital models and for a simplified narrative for educating the visitors. The second case is that of fresco fragments located in a place unreachable for people. Here I will examine the potentials of material and digital copies as a deductive tool. The third case is that of the crypt, which has a multilayered fresco, a dismantled altar, and lacks the original decoration of a sky with stars. In this case, the parts of the original medieval altar have been reused for making several other objects. Hence, the digital restoration can help with reassembling the altar, regardless of the actual practice with the remaining pieces. The final part is dedicated to 3D models that were made using Agisoft Metashape software. This serves as a practical part of the thesis that aims to show the starting of the virtualization process and its application in cultural heritage.

Keywords: Digital Restoration, Medieval Art, Archaeology, Torcello

Virtual Restoration Proposals for the Basilica of Santa Maria Assunta in Torcello

Introduction

"Emicat aula potens, solido perfecta metallo,
Quo sine nocte manet continuata dies…"

Venantius Fortunatus (*Ad Vitalem episcopum Ravennensem I, I*)

The Master's thesis titled "Virtual Restoration Proposals for the Basilica of Santa Maria Assunta in Torcello" aims to analyze and present the theory of virtual restoration and to implement it in the conservation process of the basilica in Torcello. While thinking and reading about digital restoration, I have realized that few papers are devoted to its theoretical aspect. Instead, a large number deals with practical issues and computer science, such as software processes, image rendering, model creation, etc. But before going into practical aspects of it, and before implementing it in a cultural heritage project, one should turn to the theory first. Because anything is possible in the domain of the virtual, it has become an immensely powerful tool that is almost able to substitute the original objects. Hence, its use needs to be controlled. Theory, with its relation to the postulates of practical restoration, as well as its ethical concerns, is able to control the practical use. Anything can be made virtually, only if the context is justified. Therefore, to be able to present a valid set of proposals for the use of virtual technology and its application in the church of Torcello, I had to use a multidisciplinary approach.

The structure of my thesis reflects the logic of my approach. I have divided it into 6 parts. The first 4 cover different disciplines and sciences that allowed me to base my ideas and proposals on them. The 5th chapter is the main chapter that functions as a summary of the ideas and conclusions drawn from the previous ones. The last one is the appendix that shows my work in the practical domain, using the Agisoft Metashape software to produce 3D models.

The history of Torcello is presented in the first chapter. It allowed me to briefly introduce the history of the island and its main monuments. The data presented here are based on archaeological finds and historical research. A particular problem was the historiography of the church and its architectural development. Various authors in various periods have claimed that different parts belong to different periods. Some of them gave plausible evidence, while the others were more speculative. Therefore, I have listed the main issues and the main theories, even if they are contradictory, to illustrate this bibliographical problem. Special attention was devoted to the internal decorations of the basilica, mainly the wall paintings and mosaics. These were crucial, as all the proposals are directly related to them and the architectural fragments of which they are an inseparable part. Another reason is that the mosaics are the most famous part of the internal decoration and the reason for the fame of the church in the lagoon and beyond. Hence, a basic art historic and iconographic description was needed. The final part of the historical overview is the listing of the other religious objects on the island. This is done as an argument for the popularity of the Benedictine cult and its connection to Saint Martin who is depicted in a mosaic and a fresco inside Santa Maria Assunta, and who also has the crypt dedicated to him.

Brandi's "*Teoria del Restauro*" proved to be an invaluable source even for the virtual domain. Hence, I dedicated the second chapter of my thesis to the general overview of the practical restoration theory, its connection to museology, and the theory of media. Even though this might sound a bit "all over the place," the cultural object is the connecting nod for all three. I support the understanding of the virtual restoration as a consequential act that depends on the choices of its practical counterpart. Hence, I started with the capital opus that philosophically argued and postulated the restoration of cultural heritage as a discipline – Brandi's "*Teoria del Restauro*." After I have presented its main concepts, I moved into museology. Restoration of cultural heritage in large part overlaps with the activity of museology since both care for the object, its documentation, and its presentation. Regarding the latter, I have chosen two important theories, the one presented by I. Maroevic that counts museology in the informational sciences and in general is more analytical; the other one is that of B. Deloche who has a more philosophical and a more literary approach. In his view, museology is a discipline of philosophy that is an auxiliary tool for other sciences. Whichever of the two approaches one decides to follow, the result is the same: the purpose of the object is to document the past reality in the present through the aiding of the museum. The communication of a message for the purpose of education is what connects

museology and restoration theory with the theory of media. In that section, I have examined and presented the concept of the original and the copy, as well as W. Benjamin's aura of the original. The main question is: what happens when we encounter the digital version of a material work of art?

The next part is dedicated to virtual restoration. It is a direct continuation of the Brandian postulates applied to the virtual domain. Two major concepts that are presented there are virtual restoration and virtual reconstruction. Although they are highly similar, they are indeed two different approaches that are governed by different principles. Each of them has certain problems that stem from the nature of the digital domain and can be traced to the issues originating from practical principles. What characterizes both virtual restoration, and even more so virtual reconstruction, is the tendency to overdo the model, resulting in a loss with its material original from which it drains its validity. If the bond is severed, a self-referent digital object is obtained that can be equated with a forgery. However, as I mentioned earlier, all the interventions in the digital realm are allowed provided that they have a valid justification. Most of the arguments for my restoration proposals are based on the concepts described in this chapter.

One cannot deal with historical objects without understanding the period that they represent. For that reason, I dedicated a chapter to medieval art and intangible religious heritage. The concept of functionality is explained since the contemporary fine art view cannot be applied to medieval art if one wants to understand it in its essence. I have also presented the history of aesthetics and the development of the concept of an image throughout the Middle Ages. This I deem important if one wants to recreate a spatial feeling with the restoration interventions in the church. The final part of this chapter is dedicated to Carolingian art because I used surviving fragments of wall painting for virtual restoration and to propose certain reconstructions.

Finally, the main chapter is the fifth one in which I give my restoration proposals. The concept that is applied is the causal relationship between the practical approach and virtual restoration. Firstly, I present the problem for three different parts of the church. The first one is the problem of two-layered wall decoration in the apse and the question of the authenticity of the apse. The second one is the recreation of the interior and function of the crypt with its pergola and painted starry sky on the vault. Lastly, the newly discovered frescoes in the diaconicon are posed as a separate problem that is more museological than conservational. After presenting the main

issues, my solutions in the domain of practical restoration are given. Each one is argued based on Brandi's principles but also bearing in mind the museology theory and the educational aspect. The virtual restoration/reconstruction is then proposed depending on the practical solutions. Usually, the resulting proposal is a narrative that enhances the experience of the visitor and reveals the lost parts of the original.

Lastly, the appendix explains the logic of the software and how it is used to make a model. Conceived as the scientific part of my Master's thesis, it is related to the 3D models that I made. In it, I explain the computing process of image pairing, calculation of the coordinates in the point cloud, triangulation of the dense cloud, and surface model production. This is followed by the explanation of the 9 models that I have made and the practical thoughts and concerns that I have had. All of them can be used for further manipulation and production of other, more advanced virtual models.

Hence, a few questions can be asked based on this introduction. How does the practical restoration affect virtual restoration? How are the material and the digital object related to one another? What are the pros and cons of digital technology application in cultural heritage? And lastly, can a digital object substitute the original one and thus interfere with our notion of a historical narrative and the museum as an institution?
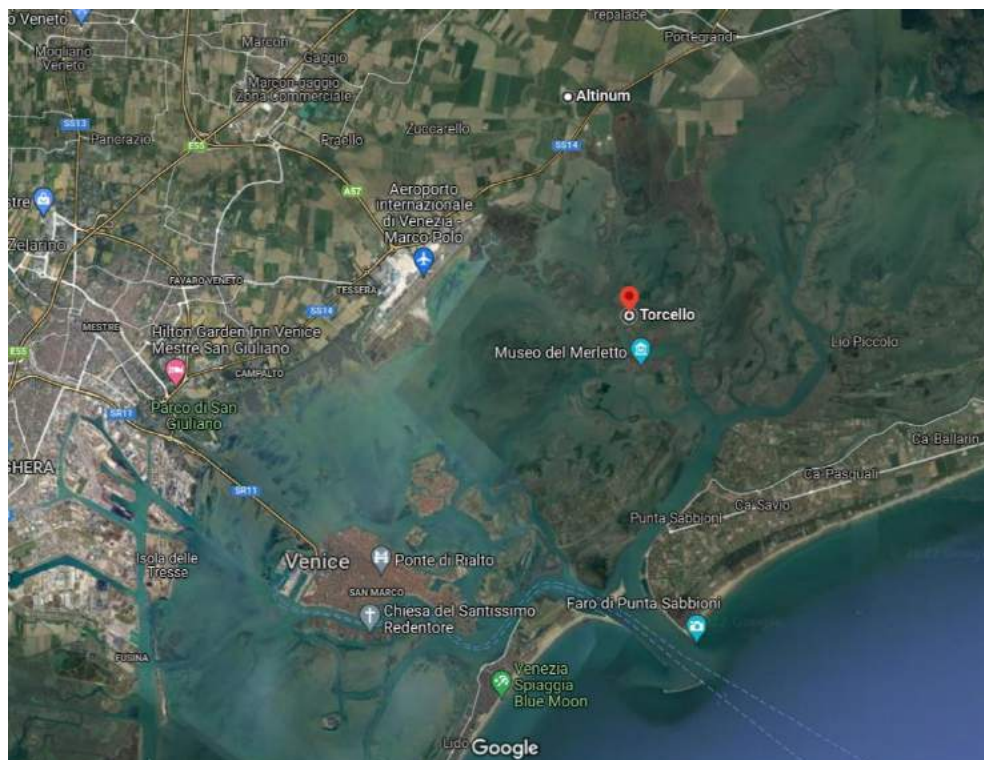
History of Torcello

The island of Torcello, located in the northern part of the Venetian lagoon, was always analyzed in its relation to the city and the Republic of Venice. The main issue here is the shadow of the Venetian past that cannot be avoided so easily. This is mainly because the chronicles that mention Torcello's origins and history give little information that is often hard to trace. It is hard to disentangle the complicated narrative that the Serenissima used as its national propaganda. These narratives, which were presented in the official chronicles, tended to absorb the origins of other parts of the lagoon (including Torcello) and describe the mythical events that led to the rise of the Republic of Venice. However, thanks to the recent archeological excavations, the real history, and development of the island's settlements can be reimagined. Therefore, in this chapter, I will try and narrate a short reconstruction of the island's past, its development, and the construction of its most important monument, the basilica of Santa Maria Assunta.

1 The island of Torcello with the Basilica of Santa Maria Assunta

Development of the Settlement in the Lagoon

One of the texts that narrate the legend of how Torcello was founded is the *Origo Civitatum Italiae*, more specifically in the part called *Chronicon Gradense*. According to it, the pagan hordes destroyed the town of Altinum (also known as Altino) which made its inhabitants move out. They have been led by a priest Gimignano who foretold the fall of the barbarians and the rise of the new settlement. According to the legend, the refugees from Altinum came and occupied seven islands. To each was given a name of one of the gates of the devastated city as a way of connecting it to the origins. Soon after their arrival, a church was constructed in the name of the Virgin Mary. This was not the only religious building on the island. According to another priest, this time by the name of Mauro, more churches were constructed. He had a divine providence in which he was told where to build churches. After sharing this with the tribune Aurio, they went together and started marking the sites from the vision. Therefore, these two legends show that even though Torcello was created as a consequence of a barbaric invasion, it was also meant to be a city on its own with a future revealed in a divine vision.[1]

2 Altinum (Altino) and Torcello

---

[1] E. Crouzet-Pavan, "Venice and Torcello: History and Oblivio", *Renaissance Studies,* No. 4, 1994. pp. 421-422. https://www.jstor.org/stable/24411939 [11.12.2021]

According to the legend, the main character to blame for the destruction of the inland cities is Attila. His hordes were fighting the Lombard kings which led to the migration of people from Altino to the lagoon. The sack of Altino by the Huns happened around 452.[2] The refugees were guided, at least spiritually, by St Heliodorus, the first bishop of Altino. This narrative was promoted in the chronicles *Istoria Veneticorum* by Giovanni Diacono in the 11th century during the reign of doge Pietro II Orseolo in Venice.[3] The full embrace of it came in the 14th century's chronicle of the doge Andrea Dandolo.[4]

The main non-Venetian text that discusses Torcello is *De Administrando Imperio*, written by the Byzantine emperor Constantine VII Porphyrogenitus in the 10th century. In it, Torcello is mentioned as an Emporion Mega – a large port that served as an important point of connection between the trade routes of East and West.[5] His description is very accurate, positioning the island between Ammiana and Murano. Being an exceptional historian, Constantine based his description on the earlier sources. His commentary is of great value because it was written half a century before Giovanni Diacono and in a different cultural/political climate, mainly a non-Venetian one.[6] It also describes Torcello as a seat of a bishop and a *Magister militium*.[7]

Since a commentary came from the Byzantium and can be regarded as an accurate historical source, it is only logical to turn now to the findings in archaeology that will allow us to have a clearer picture of what Torcello looked like, how it really came to be, and hence, how the basilica itself has been constructed.

Nowadays, the island of Torcello, together with Burano and Mazzorbo, is usually seen as a one-day trip outside of Venice. They have few inhabitants compared to 2500-3000 that lived there in the 10-11th century.[8] In the case of Torcello, this is a fortune as the vast majority of the island is completely empty, therefore serving as a good place for archaeological excavations. After it had been gradually abandoned in the 15th and 16th centuries, the major part of it was transformed

---

[2] S. Zanetto, *Tradizione Costruttive nell'alto e medio Adriatico (secoli VII-XI),* Sesto Fiorentino, 2017. p. 44
[3] S. Gasparri, "The formation of an early medieval community: Venice between provincial and urban identity," in: *Three empires, three cities: identity, material culture and legitimacy in Venice, Ravenna and Rome, 750-1500, Oxford, 22-24. March 2014*, ed. V. West-Harling, Turnhout, 2015. p. 36
[4] D. Calaon, *Quando Torcello era abitata,* Venice, 2013. pp. 109-110
[5] ibidem. p. 109
[6] E. Crouzet-Pavan, op. cit. p. 420
[7] S. Zanetto, op. cit. p. 44
[8] D. Calaon, op. cit. p. 116.

into agricultural terrain leaving all the archaeological strata unaffected underneath it.[9] Thanks to the depopulation of the island, the history of Torcello and the early settlements in the lagoon can be understood.

The islands in the lagoon were inhabited during the beginning of the Imperial period of Rome.[10] During the 5th century, a stable settlement was already developed. It functioned as a trade hub between East and West, as well as a place for salt production and fishing.[11] This was nicely described by Cassiodorus: "The inhabitants have one notion of plenty, that of gorging themselves with fish. Poverty therefore may associate itself with wealth on equal terms. One kind of food refreshes all; the same sort of dwelling shelters all; no one can envy his neighbor's home; and living in this moderate style they escape that vice [of envy] to which all the rest of the world is liable. Your whole attention is concentrated on your salt-works."[12]

The port of Altinum started to decline already during the imperial times as the canals started to silt up. Consequentially, it became harder to unload goods.[13] At the same time, the development of smaller, peripheral ports was part of a process that led to the decline of the importance of the city ones.[14] The new ports were better positioned on the numerous islands of the lagoon and allowed for easier ship access. Hence, as Altino declined, Torcello, Cittanova, and Rivoalto gained importance as new trade centers between the Lombards, Arabs, and Byzantine Empire.[15] As a result, a rich upper class of nobility was formed. This class was the main investor in new constructions and renovations on the island. The overall appearance of the cities in the northern part of the lagoon was closer to the Carolingian ones than to the Byzantine ones.[16] It can be concluded that the reasons for the population increase in the islands are the gradual withdrawal of the Byzantine military rule in the lagoon, the increase in trade that resulted in the formation of the local elite, and the natural formation of the navigable canals. There were no mass migrations strictly due to the presence of the Lombards. The main flight was that of the archbishop Paolo of

---

[9] D. Calaon, E. Zendri and G. Biscontin, *Torcello scavata. Patrimonio Condiviso*, Venice, 2014. p. 39
[10] Ibidem, p. 209
[11] Ibidem, p. 213
[12] Cassiodorus, *Variae, 12, 24,* trans. S.J.B. Barnish, Liverpool, 2006. p. 178.
[13] D. Calaon, *Quando Torcello era abitata*, p. 110
[14] D. Calaon, E. Zendri and G. Biscontin, op. cit. p. 213
[15] D. Calaon, *Quando Torcello era abitata*, p. 110
[16] D. Calaon, "Ecologia della Venetia prima di Venezia: Uomini, Acqua e Archeologia," in: *Hortus Artium Medievalium Journal of the International Research Center for Late Antiquity and Middle Ages,* 20/2, 2014. p. 813

Aquileia to Grado. This divided the patriarchate because Aquileia remained under the Lombard rule, while Grado was part of the Byzantine territories.[17] This dispute between Aquileia and Grado will have a lasting influence on the politics within the lagoon for centuries to come.

Even though Torcello is, at least by today's standards, close to Venice (the former Rivoalto), historically it had different development and depended on different influences. The moving of the people from Altino towards Torcello, Burano, and Mazzorbo was also a consequence of the changes in the flow of the River Sile. Their position within the lagoon created a natural "defense" as well as a good position of the trade routes. One such example is the "Canal Grande" of Torcello that follows the flow of the Sile as one of the main navigation routes towards the inland.[18] Unlike Torcello, Rivoalto, which started to gain its importance in the 9th century, depended on Meduacus (today's Brenta river) and the Po valley. It soon became the most important connection between the Byzantine Empire and the West, leading to the formation of today's Venice.[19] Another example of the differences between the two settlements is in the construction of the churches. The foundation of the basilica in Torcello is a typical Roman one that can be found also in Altino; unlike the Venetian ones that have wooden pols stabbed into the soil.[20]

3 The map of today's lagoon of Venice with the islands of Torcello, Burano, and Mazzorbo

---

[17] S. Gasparri, op. cit. pp. 39-40
[18] D. Calaon, *Ecologia della Venetia prima di Venezia: Uomini, Acqua e Archeologia*, p. 806
[19] D. Calaon, *Quando Torcello era abitata*, p. 111
[20] Ibidem, p. 113

The main construction material for houses was wood. It was the easiest material to find, transport, and shape. Contrary to popular opinion, Torcello was a rich and bursting town, densely populated with complex wooden structures serving as residences, artisan workshops, and storages.[21] None of the cities on the islands in the lagoon had fortifications (which can already be used as an argument against the legend of barbaric sacks). Regarding the population, it consisted mostly of servants and slaves who worked in the ports, shipyards, and docks. As mentioned before, there was a ruling class of nobility that owned the land. All of them lived in accordance with the water, and didn't struggle as people today might think.[22]

The bishop was one of the main figures in the town. Bearing in mind all of the above-said, it is logical that Torcello was chosen as a place suitable for building the main church. The reason is not the barbaric invasion, rather an economic development and the flourishing urban character of the new settlement.[23] Compared to Altino that was going through a political and economic crisis, Torcello was becoming the new center, with an increasing population. However, it did not sever its ties with Altino. Rather, it was understood as a periphery of the former Roman city. The proof of this can be found in the bishop's title that was "the bishop of Altinum." Apparently, there was no recognition of Torcello as a whole new settlement, rather as part of the old city.[24] Therefore, in 639 the construction of the first cathedral in Torcello was started during the reign of Byzantine emperor Heraclitus and was dedicated to Santa Maria Genetrix.[25] The church was finished and the baptistery was built during the reign of bishop Deusdedit I (692-724).[26] The church had two subsequent changes that led to its current appearance: in the 9th century during Deusdedit II, and in the 11th century during the Orseolo rule;[27] as well as a heavy restoration in the 19th century.

Since the 14th century, the Republic of Venice started developing a plan of focused production and urbanization, i.e. the industry of glass making was in Murano; the fisherman moved

[21] Ibidem, p. 114

[22] D. Calaon, *Ecologia della Venetia prima di Venezia: Uomini, Acqua e Archeologia*, p. 806

[23] D. Calaon, *Quando Torcello era abitata*, p. 112

[24] D. Calaon, *Ecologia della Venetia prima di Venezia: Uomini, Acqua e Archeologia*, p. 810

[25] I. Andreescu-Treadgold, "A Ninth-Century Chapel in the Basilica's Crypt at Torcello," in: *Per l'Arte da Venezia all'Europa, Studi in Onore di Giuseppe Maria Pilo,* Venice, 2001. p. 55

[26] G. Trevisan, "Il rinnovamento architettonico degli edifice religiosi a Torcello, Aquileia e Venezia nella prima meta del secolo XI," in: *La reliquia del Sangue di Cristo: Mantova, l'Italia e l'Europa al tempo di Leone IX, Atti del Convegno internazionale (Mantova, 23-26 novembre 2011),* ed. G. Cantarella and A. Calzona, Verona, 2012. p. 480

[27] Ibidem, pp. 480-481

to Burano, etc. This plan left Torcello on the outskirts and as such, it became an unpopular place for living. In addition, since the late Middle Ages, the canals became gradually filled with sand making them less accessible to larger boats.[28] As mentioned above, in the 16th century it was almost completely depopulated and turned into a horticultural land. For that reason, as well as proximity to the seat of the Patriarch, the bishop moved his residence to Murano in the 18th century.[29]

Basilica of Santa Maria Assunta

According to the epigraph discovered in the crypt in 1895, the church was started in 639 during the exarchate of Isaac, under the rule of emperor Heraclitus, while the *Magister militium* was Maurizio.[30] This is a valuable historic document not just for the church, but also for the evidence of the political past of the northern lagoon and Adriatic. The exarch Isaac fought the Lombard king Rothari and was probably killed in 643 in the battle of Scultenna.[31] The location of this stone with an inscription describing the precise date and former dedication of the church was on the right-hand side of the wall of the inner apse of the crypt. Its strange position allowed for a conclusion that it does not correspond to the current structure of the basilica. Hence, some authors hypothesize that it belongs to another church, possibly the one from Cittanova,[32] while others think that it was part of the façade of the previous versions of the Torcello basilica.[33] The latter is derived from a proposal that during one of the architectural renewals of the church, this stone was moved as it no longer corresponded with the contemporary state. Therefore, it was put in the crypt and forgotten until 1895. According to De Rubeis, this is a legal document explaining the law of the

---

[28] D. Calaon, *Quando Torcello era abitata*, p. 116

[29] M. Agazzi, "Corsi e ricorsi della storia dell'arte. Gli altari di Torcello e Murano dal Medioevo al Barocco e ritorno," in: *La Cultura del Restauro: Modelli di recezione per la museologia e la storia dell'arte,* Rome, 2013. p. 213

[30] S. Zanetto, op. cit. p. 44

[31] S. Gaspari, "The First Dukes and the Origins of Venice" in *The Medieval Mediterranean: Peoples, Economies and Cultures, 400-1500,* ed. S. Gelichi and S. Gasparri, Leiden, 2018. p. 8-9

[32] S. Zanetto, op. cit. p. 44

[33] F. De Rubeis, "L'Iscrizione del 639 di Santa Maria Assunta di Torcello tra Mitti e Realta," in *Lezione Marciane 2017-2018, Venezia prima di Venezia, Torcello e dintorni,* ed. M. Bassani, M. Molin, and F. Veronese, Rome, 2020. p. 103

church property and not just the foundation of it. Such plates were positioned in the church porticos making them accessible to the public and officially proclaiming the law.[34]

This theory, as well as the information given in the text of the plate, correspond to the information provided by Constantine VII Porphyrogenites that Torcello was an *Emporion Mega* under the rule of a *Magister Militium*.[35] It also makes sense in the light of the Byzantine military

elite settling itself in the various islands of the lagoon.[36] Then it is no wonder that Lazzarini, who discovered the epigraphic text described it as: "A ray of light that reaches us through the mist of centuries, a solitary voice that brakes the distant silence of the early life of first Venetians."[37]

The *Chronicon Venetum* which is hypothetically ascribed to Giovanni Diacono[38] (John the deacon) is the main document that describes all the construction phases of the basilica.[39] According to it, it is Deusdedit I that finished the building and the decoration of the church in 705. In the 9th century, during Deusdedit II (864-867) the church was restored. The biggest transformation

---

[34] Ibidem, pp. 105-107
[35] D. Calaon, *Quando Torcello era abitata*, p. 109
[36] S. Gasparri, "The formation of an early medieval community: Venice between provincial and urban identity," p. 40
[37] F. De Rubeis, op. cit. p. 105
[38] S. Gasparri, "The formation of an early medieval community: Venice between provincial and urban identity," p. 36
[39] S. Zanetto, op. cit. p. 44

occurred in the 11th century when the bishops were Orso (1008-1012) and his brother Vitale III (1012-1047), the sons of doge Pietro II Orseolo.[40] Historians and art historians have tried to pinpoint each of the parts of the church to a corresponding period. There are still ongoing debates and proposals for datings of certain parts i.e. the crypt or the main apse are contradictory. On the other hand, archaeological excavations have managed to shed light on certain parts and confirm the statements in the chronicle.

It might be interesting to note here that constructing a church in the Middle Ages was a symbolic act as well as a practical one. This is "especially if one considers that all the ecclesiastical structural forms– such as columns, apses, arches, towers, vaults– are references to the City of God…Church architecture is the type and symbol of the Heavenly City, the Kingdom of God, which believers were helping to fashion."[41] Especially during the Romanesque period, the church was considered a fortress that needed to separate the sacred from the profane. This idea was inspired by many construction references from the Psalms.[42]

I will now describe the main parts/characteristics of each of the phases of the church according to the most popular theories and findings.

According to the archaeological findings in the 4th aisle of the church, there is evidence dating to the 6-7th century that confirms the text narrated in the epigraph. The foundation of the church resembles the Roman foundations with pits containing fragments of bricks and stones.[43] Based on the excavation results, the baptistery was dated to the mid 7th century together with the inner wall of today's crypt. Both were made using the same construction techniques.[44] Based on the remains of the baptistery, we know that it was a circular structure with two small apses on the eastern side, adjacent to the entrance. Inside it was a *deambulatorium*, probably surmounted by a dome. Regarding the church, it was smaller than the present one; the front façade was probably 3 or 4.5m indent with respect to the current one. A portico, that served as a connecting part, probably existed between the two structures. The enlargement of the basilica, which shows that there was a

---

[40] Ibidem, p. 44
[41] R. Toman, Introduction in: *Romanesque*, trans. F. Hulse, Potsdam, 2015. pp. 13-14
[42] Р. Асунто, *Теорија о лепом у средњем веку,* прев. Г. Ерњаковић, Београд, 1975. стр. 88-89
[43] D. Calaon, *Quando Torcello era abitata*, p. 113
[44] D. Calaon and M. Bergamo, 2020, TORSMA2020, Manuscript in preparation

large financial investment, meant that the warehouses and places for the production of goods had to be moved.[45]
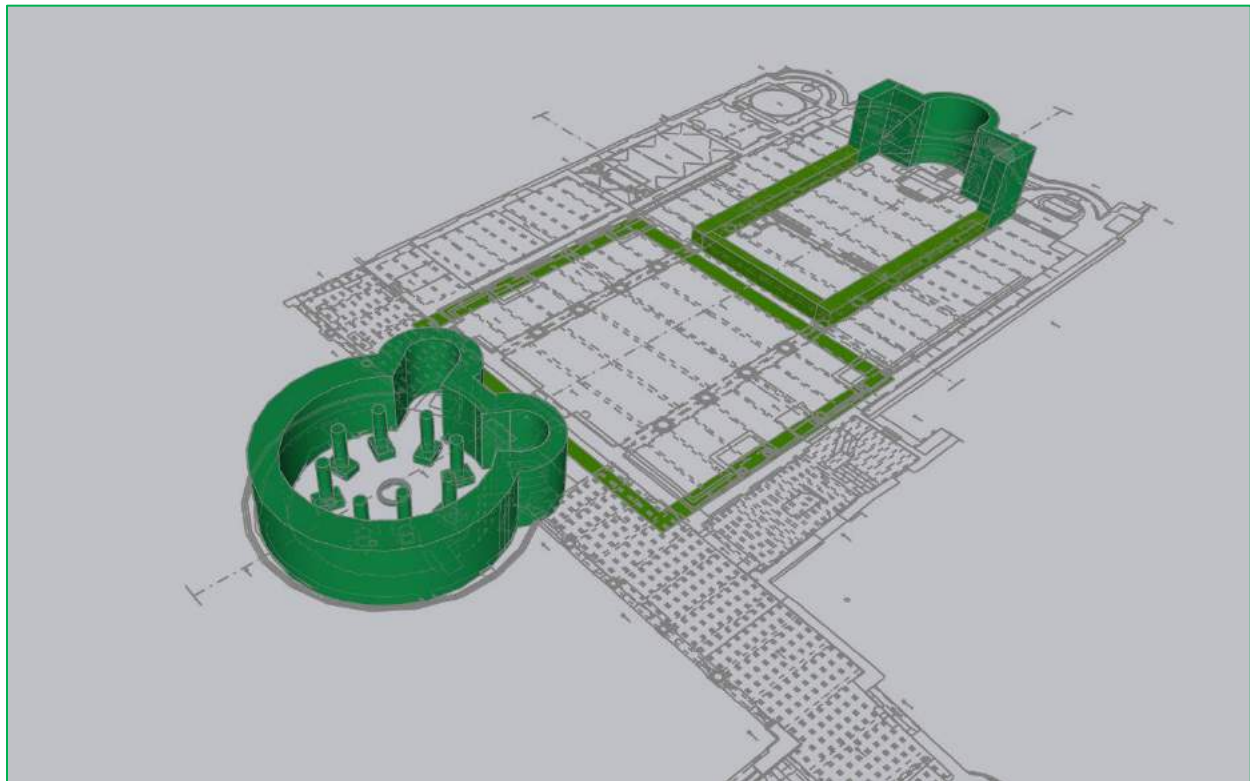
5 The floor plan of the 7th-century church

The 9th century is when the crypt and the synthronon were constructed and the fresco decoration[46] of the main apse was done, according to Zanetti.[47] The crypt had two lateral monophores that permitted the light to enter it. The holy remains of St Heliodorus were brought there by bishop Paolo during his flee from Altino and were kept in a Roman sarcophagus. This dating of the crypt to the 9th century is also supported by Agazzi, who claims that it was created to house the relics. The remains of other saints from Altino– Liberale, Tabra, Tabrata, Teonisto–were also brought from there because it didn't make any sense for them to be kept in Altino.[48] According to him, the construction of the crypt followed the same action done in Grado by bishop Fortunato

---

[45] D. Calaon, E. Zendri and G. Biscontin, op. cit. p. 216
[46] Other authors, such as Fabbri and Trevisan, disagree with this and place the fresco decoration of the main apse in the 11th century. This dating is now accepted.
[47] S. Zanetto, op. cit. pp. 47-48
[48] M. Agazzi, "Torcello Medioevale Scultura e Architectura," in: *Hortus Artium Medievalium Journal of the International Research Center for Late Antiquity and Middle Ages,* 20/2, 2014. p. 826

II in 824. He created an apsidal crypt in Sant' Agata to house the relics. It was positioned on the same axis as the main apse of the church, just like the one in Torcello would be. Both are inspired by the annular crypt of Sant' Apollineare in Ravenna.[49] The relics that were housed in it were later relocated to various altars around the church.

Andreescu, like Agazzi and Zanetti, places the crypt in the 9th century.[50] She also adds that the decoration needn't have necessarily been done during the reign of Deusdedit II. The religious services were no longer held there since the 17th century.[51]
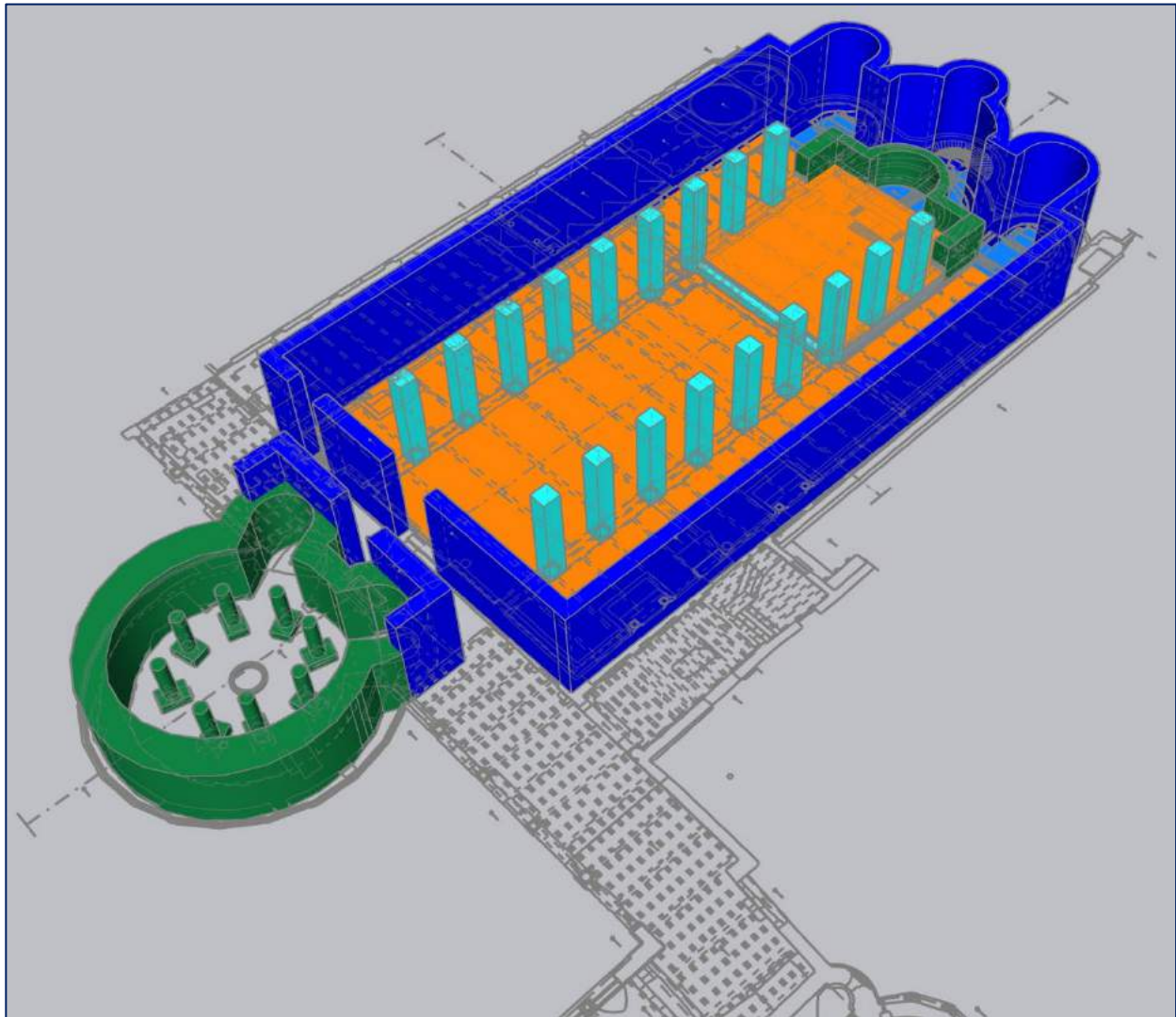
6 The floor plan of the 9th-century church

---

[49] Ibidem, p. 826

[50] I. Andreescu-Treadgold, "The Mosaics of Venice and Venetian Lagoon: Thirty-five Years of Research at Torcello," in: *Arte Medievale,* Rome, 2013. p. 61

[51] Ibidem, p. 61

Agazzi also states that with the addition of the crypt, the apses on the lateral chapels were also constructed. All of this is placed in the 9th century.[52] Vecchi, too, states that the apses were added in the 9th century, according to the proposal of Bettini. He explains in his hypothesis that the church originally resembled in its plan the basilica of Parenzo with the extradossed polygonal apse visible from the outside, and prosthesis and diaconicon on the inside of the lateral chapels in the side naves. These were not visible from the outside. According to Forlati's theory, the original church in Torcello had to resemble the one in Grado or San Giovanni Evangelista in Ravenna.[53]

The excavations done by Forlati in the 1920s in the naves of the church revealed a black and white mosaic in the *sectile* technique. It is located 20cm below the current floor level, and parts of it are still visible today.[54] They were covered in the 11th century with a new layer of mosaic floor decoration.

The great restoration was done during the Orseolo rule. This is understandable since the 11th century is described as a period in which "Europe cloaked itself in the robes of the new
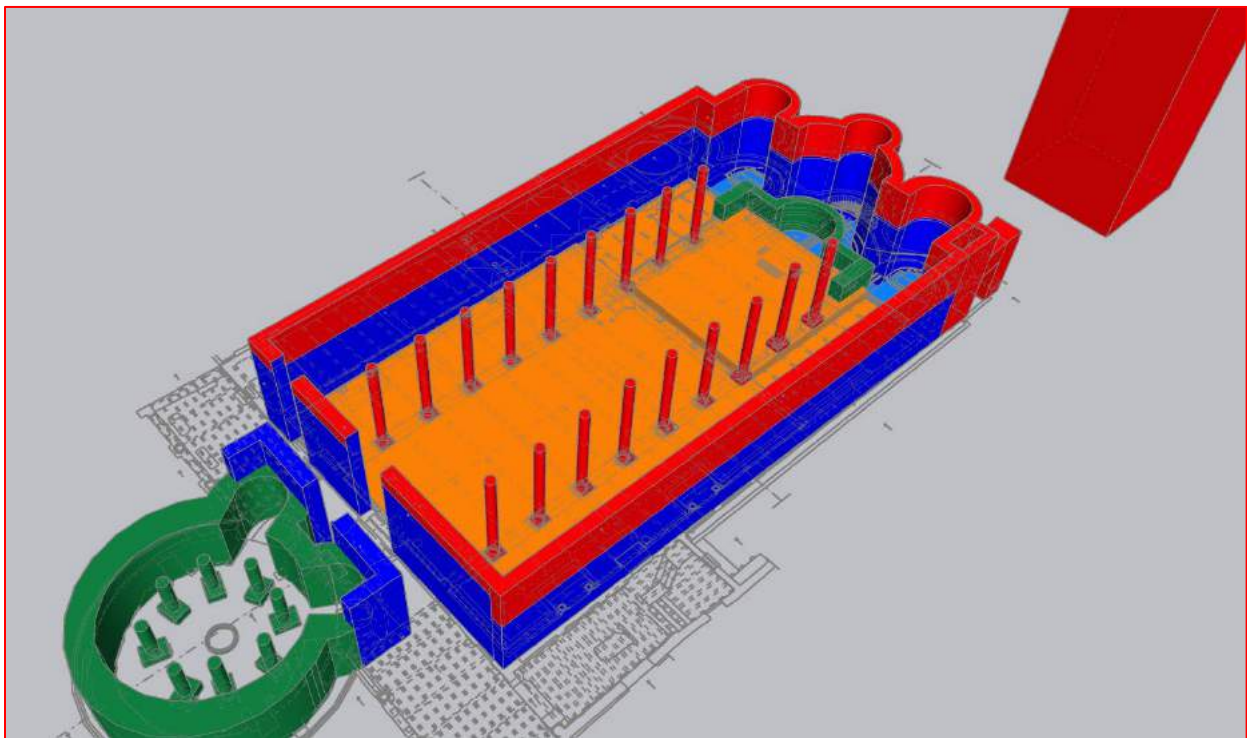
7 The floor plan of the 11th-century church

---

[52] M. Agazzi, "Torcello Medioevale, Scultura e Architectura," p. 826
[53] M. Vecchi, *Torcello Nuove Ricerche,* Rome, 1982. pp. 26-28
[54] S. Zanetto, op. cit. p. 47

basilicas or reconstructed old ones."[55] According to Giovanni Diacono, the whole church has been refurbished: "*Sancte Mariae domum et ecclesiamiam pene vetustate consumptam recreare studiosissime fecit.*"[56] This reconstruction included the addition of the side apses, arched collonades that divided the nave into three parts, the relocation of the bodily remains of St Heliodorus under the main altar, creating a new set of mosaic floor decoration, and the mosaic decoration of the interior walls.[57] According to Agazzi, during the same period, the capitals of the columns were created reviving the style of the early Christian art of Ravenna from the 5th and 6th centuries.[58] The bell tower was also added in the 11th century.[59]

The 11th century saw the renovations of many churches, both cathedral and monastic ones according to Ridolfo il Glabro.[60] "Whoever took part in the construction work, either by giving building materials or physically working on the site, was blessed with the Grace of God."[61] But, politically speaking, the 11th century was a turbulent one and Giovanni Diacono narrates this as well. He mentions Pietro II's political maneuvers between the Ottonians, Byzantines, and Venetians. The doge was a friend of emperor Otto III,[62] but his sons, the bishops of Torcello swore their allegiance to the patriarch of Grado, and thus to the Byzantines. The famous feud between Aquileia and Grado sparked once again. The patriarch of Aquileia was a pro-imperial one, while the one in Grado was more inclined towards the Byzantines. Therefore, the refurbishing of the church in Torcello was a political act that was supposed to demonstrate the close ties with the East, rather than with the Ottonians. Consequentially, the Byzantine workshops were brought to execute the mosaic decorations as well as the sculptural ones with motives imported from the East.[63] A parallel can be drawn between a similar act done by Charlemagne 200 years earlier. For his chapel in Aachen, he took columns from Rome and Ravenna as a way of symbolically obtaining religious prestige. It can be assumed that the reason for bringing the mosaic workers from the Byzantium,

---

[55] Р. Асунто, нав. дело. стр. 88

[56] S. Zanetto, op. cit. p. 49

[57] Ibidem, p. 49

[58] M. Agazzi, "Torcello Medioevale, Scultura e Architectura," p. 818

[59] S. Zanetto, op. cit. p. 47; M. Vecchi, *Torcello Ricerche e Contributi,* Rome, 1979. p. 8

[60] G. Trevisan, op. cit. p. 479

[61] R. Toman, op. cit. p. 16

[62] S. Gasparri, "The formation of early medieval community: Venice between provincial and urban identity," pp. 26-27

[63] L. Fabbri, "La cripta di Santa Maria Assunta a Torcello: il richiamo a Bisanzio all'interno della politica di legittimazione orseoliana," in: *Citazioni, modelli e tipologie nella produzione dell'opera d'arte. Atti delle Giornate di studio. Padova 29-30 maggio 2008,* 2011. p. 6

the Orseolos wanted to do a similar thing. The refurbishing of the church was not just a political or a religious act, "but also guarantors that they would never be forgotten."[64]

The reason why I am narrating the historical circumstances in this passage is that it allowed some historians to place the crypt in the 11th century, rather than in the 9th. Fabbri, for example, counters Andreescu's arguments for the dating of the crypt. According to him, the fact that the sculptural decoration was done in the 9th century does not mean that the crypt was done at the same time. On the contrary, it is possible that the crypt was constructed at a later date and that the decorations were put there from another place.[65] He also mentions the conclusions of the Polish archaeologists who stated that the crypt with its outer apse survived the 11th-century restoration and is originally from the 9th. However, both Andreescu and the Polish, fail to connect and explain the crypt's architectural relationship with the synthronon in the main apse. Fabbri explains that due to certain constructional aspects and relations of the main apse and the crypt's outer apse, there were two architectural interventions in a short time span. Therefore, the frescoes in the apse and the two lateral apses on the side chapels belong to the rule of Orso; while the synthronon, the crypt,
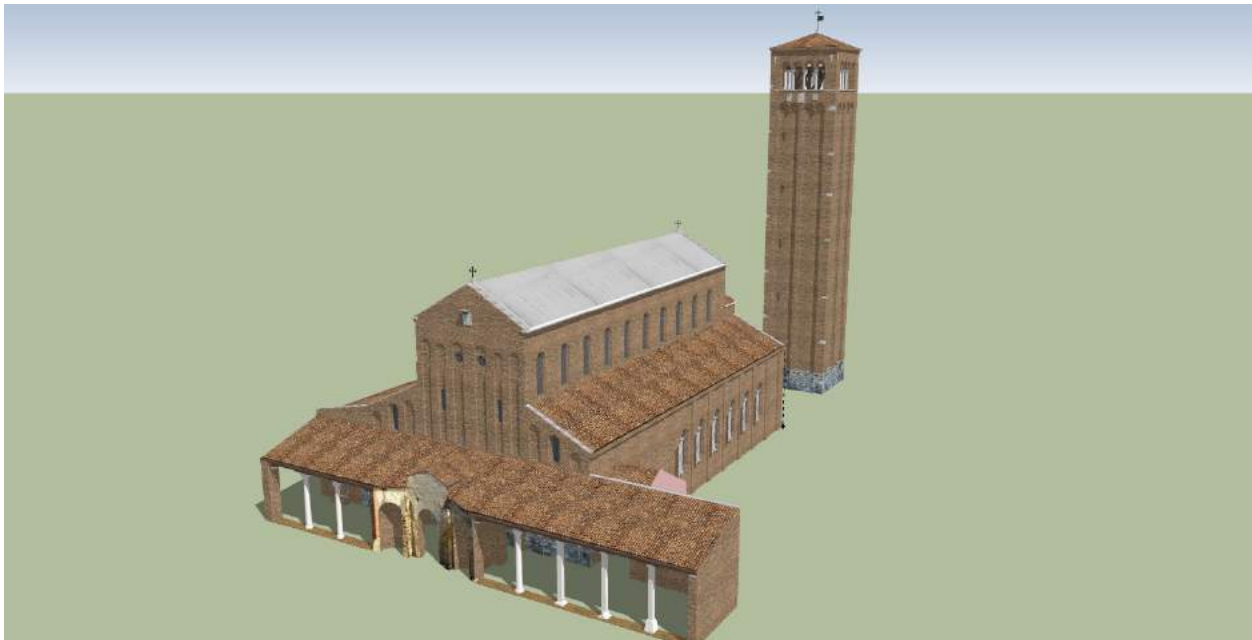
8 The model of the basilica in Torcello

---

[64] R. Toman, op. cit. p. 17
[65] L. Fabbri, op. cit. p. 4

and the outer apse were added during Vitale's reign.[66] This is further evidenced by the fact that the synthronon slightly covers the frescoes meaning that it was added after their execution.[67]

The argument that I personally find the most interesting is putting the architectural concept of the crypt in the historical and political narrative of 11th century Venice. It is obvious that crypts in the East and the West have different appearances and purposes. Fabbri argues that the one built in the Santa Maria Assunta is not a typical Western one, rather a modified version of the oriental. Modified in that it was built to allow for the believers to pass through it and pray in front of the relics preserved in the altar. As a result, like in the case of St John in Ephesos or St Euphemia in Constantinopole, the synthronon had to be raised in order for the passageway to be constructed underneath it.[68] This resulted in the architectural situation that can be seen today.

Trevisan, like Fabbri, criticized the conclusions that blindly followed the chronicles. According to him, the main thing is to analyze and compare Santa Maria Assunta with other churches from the same period. He provides a list consisting of Santa Maria Maggiore a Lomelo, San Giovanni a Vigolo Marchese, San Pietro in Valle a Gazzo Veronese, San Nicolo di Lido, and San Martino a San Lorenzo di Pasenatico in Istria. All of these churches have similar architectural characteristics as the one in Torcello, and they are all from the 11th century.[69] This goes hand-in-hand with the contemporary account of Ridolfo il Glabro who stated that many churches indeed were reconstructed in the 11th century. Hence, all of today's visible structure belongs to the period of Orseolo's restoration. The same applies to the frescoes which, according to Trevisan are also dated to the 11th century.[70]

At the end of the 13th/beginning of the 14th century, the fourth aisle was walled in.[71] Unlike Zanetti, Agazzi claims that the fourth aisle was used as a funerary area until the 12th century when it was walled in. He adds that what is today's sacristy once served as a side entrance to the church from the nearby neighborhood and Sant' Antonio channel.[72] It was reconstructed in the 18th

---

[66] Ibidem, pp. 4-5
[67] Regarding the frescoes, they were discovered in the 1930s and at that period were dated to the 7th century. However, in the 1980s they were proved originate from the 11th century. (L. Fabbri, op. cit. p. 3)
[68] Ibidem, pp. 7-8
[69] G. Trevisan, op. cit. p. 485
[70] Ibidem, p. 489
[71] S. Zanetto, op. cit. p. 49
[72] M. Agazzi, "Torcello Medioevale, Scultura e Architectura," p. 826

century. The baptistery was demolished in the same century, and a portico was constructed connecting the fourth aisle with Santa Fosca.[73]

According to a surviving document, there was another restoration of the church in the 15th century during the episcopate of Pietro V. It is stated there that between 1423 and 1426 the church was refurbished. The funds for this were obtained from the doge, the Venetian people, the bishop, and the locals as well.[74]

In the second half of the 17th century, the parts of the temple collapsed together with the portico and the baptistery. As was mentioned two paragraphs above, the baptistery was demolished and a new portico connecting the basilica with Santa Fosca has been constructed. "From this moment on, for about two centuries, Santa Maria Assunta in Torcello will suffer perhaps the most serious trauma in its history from the Orseolan period onwards," according to Vecchi.[75] Between the 17th and 19th centuries, the windows were closed and new ones opened, external decorations were either removed or redone, the internal chapels changed, the central nave has been lowered and then raised, and the apses have been retouched. The iconography of mosaics has been altered in the 18th century.[76]

Now, the history of architectural development will be briefly summarized in accordance with the latest and still unpublished archaeological information. The first religious structure in the mid 7th century consisted of the baptistery and a small church connected via a portico. During the reign of Deusdedit II in the 9th century, the church was enlarged and reached the baptistery with its narthex. In the 11th century, during the reign of Orseolo bishops, the church was once again refurbished. The pillars were substituted with columns, the apse was adorned with the mosaic, and the naves were covered with an opus sectile decorative floor.[77]

---

[73] S. Zanetto, p. 49
[74] M. Vecchi, *Torcello Ricerche e Contributi*, p. 17
[75] M. Vecchi, *Torcello Nuove Ricerche*, p. 25
[76] Ibidem, p. 25
[77] D. Calaon and M. Bergamo, 2020, TORSMA2020, Manuscript in preparation

Today, the basilica in Torcello is considered one of the artistic peaks of medieval art in the lagoon, right after the church of San Marco. Visitors are usually struck by the beauty and complexity of the *sectile* floor, as well as by the monumental golden mosaics covering the entrance wall and the main apse with *diaconicon*. In this chapter, I will briefly cover the main parts of the decoration that survived from the Middle Ages into our time. Since this is not an art history thesis, I will not be going into the iconographical analysis of the mosaics.

Regarding the pictorial decoration of the church, nothing much remains. New discoveries are the fresco fragments showing the Virgin Mary and St Martin on the arch between the diaconicon and the roof. They have been dated to the 9th century. In their style, they belong to the Carolingian art of the provinces. This can be deduced from the fact the first chapel of the Partecipazzi doge in Rivoalto, the one that will later become the Basilica of St Mark, was decorated in that style. In general, the 9th-century art of the northern Adriatic is closer in its style to the Carolingian than to the Byzantine.[78] However, the art of the Carolingian empire is a diverse one,
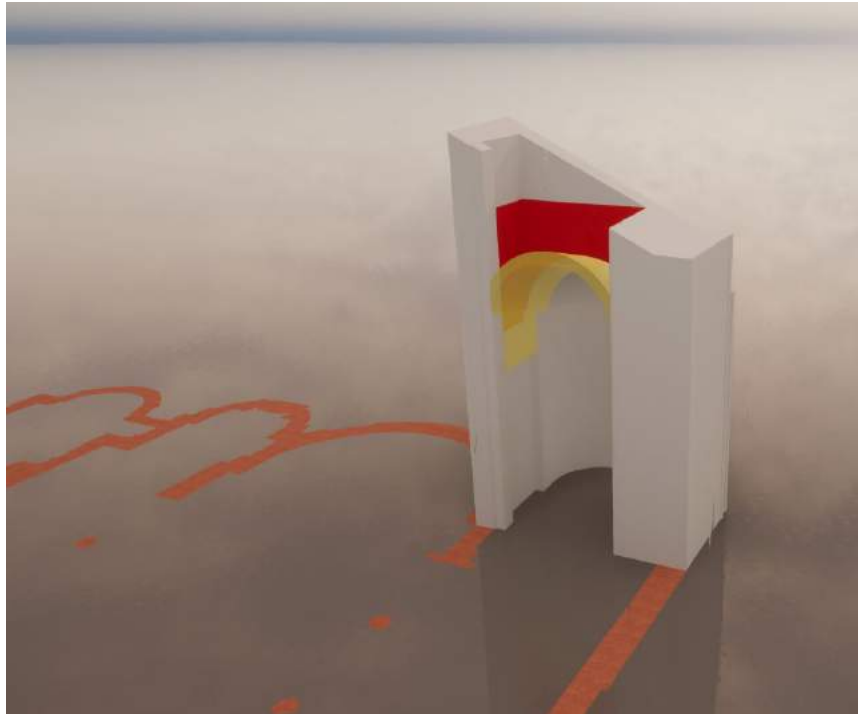
9 The location of the newly discovered frescoes (red) above the diaconicon mosaic (yellow)

[78] D. Calaon, "Ecologia della Venetia prima di Venezia: Uomini, Acqua e Archaeologia," p. 805

heavily depending on local traditions and styles.[79] Since the fragment is heavily damaged and needs to be cleaned, it is required to conserve it prior to further artistic assessment.

Based on the position of the fresco fragments, it can be inferred that the mosaic decoration came at a later date. According to Andreescu, there was an "unattested dedication" of the crypt to St Martin, a favorite Benedictine saint.[80] And, according to a documented visit by the bishop Giustiniani in 1698, the altar in the crypt "*positum in locum subterraneo sub majori Altar*" was dedicated to St Martin.[81] It is interesting to note that in the mosaic now adorning the side chapel is a depiction of the four doctors of the Church. However, instead of St Jerome (San Girolamo), there is a figure of St Martin. He is positioned on the left wall, where the entrance to the crypt stands. This spatial relation between the figure and the place of the Saint's worship allowed Andreescu to make a prophetic conclusion. "The choice of St Martin instead of St Jerome for the group in the south apse may indicate the persistence of an older, ninth-century cult."[82] This quite logically negates the proposal by Vecchi that the diaconicon mosaic is from the 9th century and then restored in the 12th.[83] If something can be concluded, it is that the mosaic workers in the 11th century paid attention, probably guided by the suggestions of the bishop or a priest, to the importance of the cult of St Martin. Therefore, they put the mosaic version of him under the frescoed one from the 9th century. Indeed, the presence of St Martin is quite understandable given that in the 12th century there were 4 Benedictine monasteries on the island.[84] Three out of four have origins before the 11th century.[85]

Even though Vecchi got wrong the dating of the mosaic, he was right when he concluded that it was inspired by San Vitale.[86] Agazzi, like Vecchi, claims that the full decoration of the crypt and the apses was done in the 9th century. His evidence for this statement lies in the inspiration with Byzantine culture and the influence from Constantinopole.[87] However, neither of the two tried to put the decoration in a socio-political context like Fabbri or Trevisan. As was mentioned

---

[79] E. Kluckert, "Romanesque Painting," in: *Romanesque,* ed. R. Toman, Potsdam, 2015. p. 384
[80] I. Andreescu-Treadgold, "A Ninth-Century Chapel in the Basilica's Crypt at Torcello," p. 61
[81] Ibidem, p. 62
[82] Ibidem, p. 62
[83] M. Vecchi, *Torcello Nuove Ricerche*, p. 37
[84] M. Vecchi, *Chiese e Monasteri Medioevali Scomparsi della Laguna Superiore di Venezia*, Rome, 1977. p. 25
[85] Ibidem, p. 27
[86] M. Vecchi, *Torcello Ricerche e Contributi,* p. 8
[87] M. Agazzi, "Torcello Medioevale, Scultura e Architectura," p. 826

earlier, both of them put the addition of the lateral apses, as well as the construction of the crypt in the 11th century. This is understandable when early Christian art had its great revival in this period. This phenomenon of creating a neo-paleochristian art goes well beyond northern Italy and can be seen in Rome and many other centers as well throughout the 11th and 12th centuries.[88] Under this assumption, it becomes understandable that the diaconicon mosaic will be inspired by the art of Ravenna from the 5th and 6th centuries. One should also have in mind the political and religious struggle between Aquileia and Grado, the allegiance of the Orseolo bishops to the Grado patriarchate, and the summoning of Byzantine workshops to produce the mosaics.[89]

The fresco depicting the bishops in the main apse has already been mentioned. Originally dated to the 7th century and then to the 11th.[90] Niero describes them as being in the Benedictine style similar to that of the frescoes from the crypt in Aquileia.[91] As mentioned before, the Benedictine monastic order had a strong presence on the island.[92] It would be interesting to further investigate this bearing in mind the feud between the two patriarchs and the political situation in which the doge and his sons found themselves. Since this is not a thesis in history nor the history of art, I will not be going into further discussion.

When the synthronon had been created in the 11th century the frescoes were covered with marble slabs, and a mosaic showing the twelve apostles and the Virgin Mary with baby Jesus has been put.[93] It would be interesting to further investigate the change that occurred when one scene, the bishops, is substituted with another, given that an image in the Middle Ages was considered a materialized contemplatable metaphor.[94] Therefore, what happens with the perception and the message the image was supposed to convey when the bishops were covered by the apostles?

In the middle of the synthronon is a *cathedra* where the bishop would sit. Above it is a bust-length depiction of St Heliodorus, the first bishop of Altino. On both his left and right are the twelve apostles standing on a grass field with flowers that can be found in the lagoon. Behind them

---

[88] M. D'Onofrio, "Medieval Architecture," in: *Rome the golden centuries*, ed. M. Bussagli, h.f.ullmann, Potsdam, 2013. p. 181

[89] According to Andreescu's research, there was a total of three workshops that produced the mosaic in Santa Maria Assunta. (I. Andreescu-Treadgold, "The mosaics of Venice," p. 199)

[90] L. Fabbri, op. cit. p. 3

[91] A. Niero, *Die Basilika von Torcello und Santa Fosca,* Venice, p. 18

[92] Check footnotes 80 and 84.

[93] L. Fabbri, op. cit. p. 5

[94] Р. Асунто, op. cit. pp. 29-30

10 Fragment of the bishop fresco from the 11th century (photo taken by the author)

is a typical golden background. From left to right they are Thomas, Tadeus, Bartholomew, Jacob, John, Peter, Paul, Matthew, Andrew, Jacob, Simon, and Philip. Above them is a line of text: *Formula virtuis maris astrum/porta salutis prole Maria levat/quos coniuge subdicit Eva*. In the upper part, occupying the whole semidome is the standing figure of the Virgin Mary holding baby Jesus. She belongs to the representational type called *Hodegitria*, the one that shows the way. Dressed in a blue *maphorion*, she resembles an empress. Above her are Greek letters identifying her as *Theotokos* i.e. the Mother of God. The Child is dressed as a *basileus*, typically holding a

11 View of the main apse with the synthronon, marble slabs, fresco fragment, and the mosaic

touching with his foot. It adds to the iconography of *Mater Dolorosa*, foretelling the future passion of Christ.[95] The effect of this mosaic is nicely described by Niero, saying that it serves as a reminder that "the space that surrounds us, the time in which we live, is a foretaste of eternity."[96] This interpretation is reasonable when one considers that art, in our notion of the word, served, through beauty as a tie between "this world and the higher, earth and the sky, and the man and God."[97] Or, in the words of Dionysius the Areopagite: "Every image is an image of God."[98]

Above the Mother and the Child is an arch with a text: *Sum Deus atque caro, patris et sum matris imago, non piger ad lapsum set flentis Proximus adsum*. The text is followed by the scene of Annunciation which is typically positioned there in Eastern churches. The Virgin is depicted holding a spindle, standing in front of a chair. Behind her is a basket with clams.[99]

Comparing the mosaics and the technique of their production as well as stylistic components with other contemporary examples, Andreescu concluded that they were all done "somewhere in the eleventh century."[100] Regarding the diaconicon and its three units (which are the ceiling with the angels and the Lamb of God, the Christ enthroned with the archangels, and the four doctors of the church), they are all from the same period. Same as in the rest of the basilica, except that in the case of the whole church, each mosaic was done by a different team.[101]

Going from below towards the ceiling, we see the four doctors of the church with the exception of St Martin instead of St Jerome. The two on the right, St Augustine and St Ambrose are dressed as bishops with a pallium, while the other two, St Martin and St Gregory the Great are dressed in papal robes with books and armbands. Above them is an inscription by Marziano Cappella quoting St Paulinus of Aquileia: "*Personis triplex Deus est et numine simplex merbitat hic terram mare fundit luminat aethram*."[102] Above it sits Jesus on a throne. On the left is a figure of the archangel Michael, while on the right is archangel Gabriel. The ceiling represents four angels

[95] A. Niero, op. cit. pp. 18-20
[96] Ibidem, p. 20
[97] Р. Асунто, op. cit. p. 36
[98] R. Đokić, *Istorija estetike III*, Beograd, 2012. p. 246
[99] A. Niero, op. cit. p. 20
[100] I. Andreescu-Treadgold, "The mosaics of Venice and Venetian Lagoon: Thirty-five Years of Research at Torcello," p. 193
[101] Ibidem, p. 200
[102] God is triune as a person but unified in essence. He covers the earth with grass, spreads the sea, and illuminates the sky. (A. Niero, op. cit. p. 24)

holding a garland with the Mystical Lamb. The whole decoration of the arched vault is a reference to the vaulted ceiling of the altar chapel of San Vitale in Ravenna from the 7th century. Various animals and birds can be seen intertwined with the floral motives. Among them are the symbols of the four Evangelists.[103]

12 The diaconicon mosaic (photo taken by the author)

---

[103] A. Niero, op. cit. p. 24

The last mosaic decoration covers the whole western wall above the main portal. It is a complex scene of the Last Judgement with the iconography of the Eastern Orthodox church. This is quite logical since the workshop that produced it came from the Byzantine Empire. Going from the top level to the lowest we can see the Crucifixion, *Anastasis* (know rather as the scene of Christ entering the Limbo), *Deesis* (a typical depiction of Christ the Judge between Mary and St John the Baptist), *Etimasia* (the throne prepared for the second coming of Christ), *Psicostasia*, and the Virgin Oranta.[104] According to Vecchi, the inspiration for such complex multilayered iconography came from texts of Ephrem the Syrian, John of Damascus, the books of prophets Daniel and Ezekiel, and, naturally, the Apocalypse of John.[105]

13 The mosaic on the western wall depicting the Last Judgement (photo taken by the author)

---

[104] C. Rizzardi, "La Decorazione Musiva: Torcello e la Cultura Artistica Mediobizantina," in: Torcello alle Origini di Venezia tra Occidente e Oriente, ed. G. Caputo and G. Gentili, Venice, 2009. p. 62

[105] M. Vecchi, *Torcello Ricerche e Contributi*, p. 9

The last part of the internal decoration that I will briefly cover is the altar. By the end of the 19th century, an idea was expressed to give the church a more medieval appearance. This concerned mainly the dismantling of the baroque altar, which happened only after the First World War. This was done under Forlati, who discovered the remains of an older, medieval altar under the baroque one.[106] The design of the baroque altar was ascribed to Baldassare Longhena, but this attribution was abandoned. It is nowadays thought that the altar was created in the 18th century, during the reign of bishop Vicenzo Maria Diedo (1735-1753) or Nicolo Antonio Giustiniani. This is based on written descriptions (mainly the one from 1678) of the altar up to the 18th century when it housed the remains of St Heliodorus and St Teonisto.[107] Andreescu supposes that the pergola and the chancel screen have been dismantled during the 43-year long episcopate of Marco Giustiniani (1698-1735).[108] Perhaps the baroque altar has been set up in that period since we know that up to 1698 it had a medieval appearance.[109]
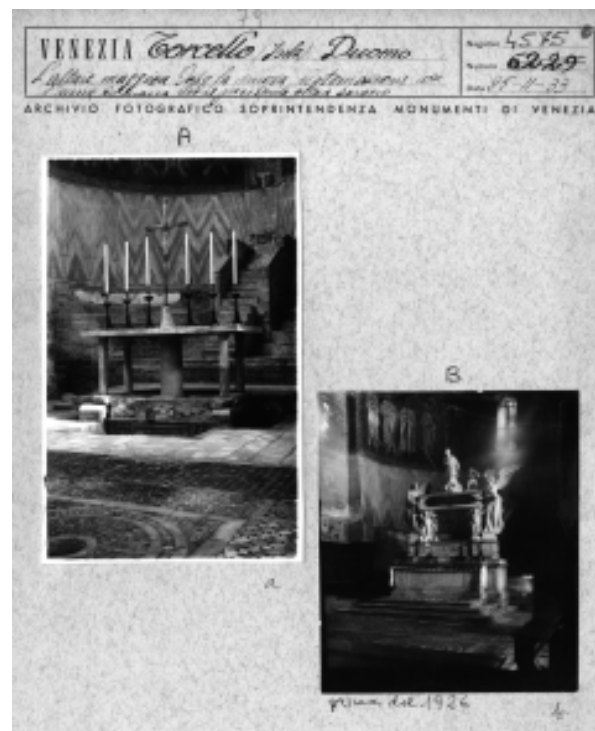
14 Left: The altar after Forlati's intervention; Right: The Baroque altar before Forlati's intervention (Agazzi, Altari)

[106] M. Agazzi, "Corsi e ricorsi della storia dell'arte. Gli altari di Torcello e Murano dal Medioevo al Barocco e ritorno," p. 206

[107] Ibidem, p. 212

[108] I. Andreescu-Treadgold, "A Ninth-Century Chapel in the Basilica's Crypt at Torcello," p. 62

[109] M. Agazzi, "Corsi e ricorsi della storia dell'arte. Gli altari di Torcello e Murano dal Medioevo al Barocco e ritorno," p. 212

The medieval remains consisted mainly of an empty sarcophagus that was used to house the relics of St Heliodorus. Forlati reused the found pieces to recreate and set the new altar for the 1000th anniversary of the foundation of the church in 1929.[110] Unlike Forlati, who dated the discovered sculptural elements to the 6th or 7th century,[111] Agazzi thinks they originated in the 11th century. His evidence is the renewal of early Christian art and artistic inspiration that came from examples in Ravenna. A similar story and conclusion for the mosaics in the *diaconicon*.[112]

Other Religious Buildings on the Island

As the legend mentioned at the beginning of this thesis states, thanks to the vision of a priest called Mauro many churches on the island have been erected.[113] What the archaeological finds have discovered will be listed here.

Santa Fosca is a small church dedicated to a martyr saint from Ravenna and located just in front of Santa Maria Assunta with which it is connected via a portico.[114] According to data presented by Vecchi, its construction began around the year 1000, and its current "Byzantine" appearance is dated to the 12th century.[115] This is in accordance with Bettini, who dated today's visible structure to the 12th century.[116] However, thanks to surviving documents, this church was sold to the monastery of San Zeno in Verona in the 9th century. Therefore, the church must have existed at least 2 hundred years before its mention in the 11th-century document.[117]

The monastery of San Giovanni Evangelista was founded before the year 1000. According to Vecchi, it was erected in 640.[118] In the 11th century, it was run by the daughter of the Doge Pietro II Orseolo, Felicita. She was the sister of the bishops who ruled from the episcopal palace

---

[110] Ibidem, pp. 206-207
[111] Ibidem, p. 208
[112] Ibidem, p. 210
[113] E. Crouzet-Pavan, op. cit. pp. 421-422
[114] A. Niero, op. cit. p. 50
[115] M. Vecchi, *Torcello Ricerche e Contributi*, p. 25
[116] A. Niero, op. cit. p. 50
[117] M. Vecchi, *Torcello Ricerche e Contributi*, p. 27
[118] M. Vecchi, *Chiese e Monasteri Medioevali Scomparsi della Laguna Superiore di Venezia*, p. 27

next to the basilica of Santa Maria Assunta. Therefore, the island was politically conquered by the noble family of Venice. It was deconsecrated and demolished soon after in 1810.[119]

In the 12th century, the monastery of San Tommaso dei Borgognoni was built under the Cistercian monastic order. It neighbored itself with the convent of Santa Margherita.[120] The furthest positioned one was the monastery of San Antonio Abbate. Its construction was at the beginning of the 11th century.[121] It was connected to the Assunta via a bridge in the late medieval/early modern period.[122] There is also a documented existence of the monastery of Sant'Angelo in Zampenigo since the 13th century.[123] Vecchi writes that it was already there in the years of 900.[124] All of these monasteries except San Tommaso were Benedictine ones.[125] This justifies the dedication of the crypt and the existence of a fresco of St Martin who was one of the favorite Benedictine saints.[126]

---

[119] D. Calaon, *Quando Torcello era abitata*, p. 117
[120] Ibidem, p. 117
[121] M. Vecchi, *Chiese e Monasteri Medioevali Scomparsi della Laguna Superiore di Venezia*, p. 27
[122] D. Calaon, *Quando Torcello era abitata*, p. 117
[123] Ibidem, p. 117
[124] M. Vecchi, *Chiese e Monasteri Medioevali Scomparsi della Laguna Superiore di Venezia*, p. 27
[125] Ibidem, p. 25
[126] I. Andreescu-Treadgold, "A Ninth-Century Chapel in the Basilica's Crypt at Torcello," p. 62

Theory of Restoration–From Brandi to Digitalization

Before addressing the main conservation issues and their potential solutions, I will cover the theoretical aspect of restoration. Therefore, this chapter is dedicated to the presentation of the main postulates of Cesare Brandi's theory, as well as digital restoration. The key question is the relation between the two: to what extent are they similar and what are their differences? The rest of the problem related to more practical issues will be addressed in detail in the next chapter, the one dedicated to the case studies within the basilica of Santa Maria Assunta.

Cesare Brandi's "*Teoria del Restauro*"

The full potential of digital restoration cannot be understood unless the basics of practical restoration theory are explained. The main figure in this field of study is Cesare Brandi. His "*Teoria del Restauro*" is considered a pivotal work that theoretically grounded the discipline of conservation and restoration. In a manner of a philosophical treatise, Brandi postulates the main concepts for preserving a work of art. This book proved to be the most influential literary source for future restorers, with its impact on practice spanning several decades, all the way into our time. The Central Institute for Conservation in Rome (*Istituto Centrale per il Restauro* also known as ICR), which was founded by Brandi, helped shape the practice and disseminate the ideas formulated in the book. Nowadays, his ideas seem rather rigid and certain concepts can be rethought and reformulated. In fact, the practical aspect does not follow Brandi's suggestions to the fullest, especially when it comes to the retouching of paintings. Nevertheless, Brandi remains the key figure even today.

According to him, restoration is defined as a "methodological moment of recognition of an artwork in its physical consistency, and its aesthetic and historic dual-polarity, in view of its transmission to the future."[127] This definition is based upon John Dewey's definition of a work of art, that is constantly equal to itself in its material aspect, whereas it is always realized as a work

---

[127] Ч. Бранди, *Теорија Реставрације*, ed. and trans. Б. Шекарић, Belgrade, p. 37.

of art in the consciousness of the observer during his/her aesthetic experience. Therefore, any intervention on an object depends on whether that object is recognized as a work of art.[128]

The other part of Brandi's definition that should be clarified is the aesthetical and historical polarity. This implies that through the first one, an object is perceived as a work of art, while through the latter, as a manmade product that is created at a certain time and a certain place.[129]

"*Only the material of an artwork is restored*," is the first axiom of restoration according to Brandi.[130] It refers to the physical consistency for it is the means of artistic manifestation. Without the material structure, an artwork cannot be, nor can it be realized in the consciousness of the observer. It is a matter of coexistence of the two – material and form. However, when it comes to physical interventions on the artwork, the focus depends solely on the aesthetical demand. Why is this so if there cannot be a visual aspect without the material one? The answer that Brandi provides us with is that the matter can be divided into "aspect" and "structure." To illustrate this concept, an example of an icon is given. In it, the structure is the wooden panel on which it is painted, and the aspect is the painted part. The difference is that one is just material support, while the other is the bearer of the meaning.[131] This is because the "uniqueness of a work of art in relation to other products of humanity does not depend on its material consistency, nor its double historicity, rather on its artistic value."[132] Getting back to Dewey, it is always the aesthetic experience that allows for the realization of the potentiality of an artwork. Therefore, the so-called "aspect" of the material is what makes an artwork what it is.

Regarding the historical aspect, it is dual for every work of art. In its first instance, it refers to the precise moment in time and space when the artist produced his artwork. In the second, it refers to the time and space in which that artwork is observed, or rather realized in the consciousness today, in the present. The time span between these two temporal points consists of a series of "presents" through which the artwork existed.[133] They play a key role, for they constitute a series of changes that might have occurred on the artwork during its "lifetime." In another part of his book, Brandi returns to clarify this concept. "Time…is present in the artwork (no longer in

---

[128] Ibidem, p. 36
[129] Ibidem, p. 37.
[130] Ibidem, p. 38.
[131] Ibidem, pp. 40-41
[132] Ibidem, p. 38
[133] Ibidem, p. 38-39

the formal, rather in the phenomenological aspect) in three different moments, regardless of the kind of artwork. In the first place, as *lasting*, during the manifestation of the artwork while it was being made by the artist; secondly, as an *interval*, as the meantime between the end of the creative process and the moment in which our consciousness actualizes the artwork in itself; thirdly, as a *moment* when the artwork hits the consciousness as a lightning bolt."[134] A similar understanding can be found in the museological theory of an object given by Ivo Maroevic in his "Introduction to Museology." He presents the theory of Peter van Mensch that talks about three different identities of the object – *conceptual, factual*, and *actual identity*. The first one is the identity of the object in the mind of the artist or the creator. This one is in Brandi's view merged with the second, that is the materialization of that idea i.e. the object itself when it was created. These two correspond to *lasting* in Brandi's terminology. The last one is the moment in which we are in contact with the object – the *moment* when the artwork hits the consciousness. Maroevic adds the historical identity that represents the *interval* from the moment of making until the present.[135]

Therefore, the two abovementioned aspects participate in the so-called dialectics of restoration, since a balance needs to be achieved between them. As a consequence, the second axiom of restoration can be deduced from this. It states that "*restoration should tend to reestablish the potential unity of an artwork only if it is possible without creating artistic or historical forgeries, and without eliminating any trace of the passing of that artwork through time*."[136] The potential unity is the unity of the aesthetic and historic demand, as Brandi calls them. But this unity should be achieved in such a way that the outcome does not become a historical fake, for it must not deceive the observer. If it does, then it is no longer recognized as the original artwork, and hence loses its artistic potential.

Now I will turn to the restoration itself and how it is understood, perceived, and argued by Brandi. The discussions based on Gestalt psychology of perception will not be part of this thesis, since it goes far beyond the topic and is not a necessity for the full understanding of Brandi's theory. However, the problem of perception, especially that of the missing parts is crucial for restoration theory. "*Artistic representation is truly and solely what it represents*: the phenomenological reduction that is used in the research of the existing, in aesthetics becomes the

---

[134] Ibidem, p. 49
[135] I. Maroević, *Uvod u Muzeologiju*, Zagreb, 1993. p. 116
[136] Ч. Бранди, op. cit. 39

very axiom that defines the essence of the artistic representation."[137] In other words, if there is a part of the depicted motif that is not visible to the observer, even though it will be mentally added, objectively it does not exist. The example that Brandi provides is a portrait of a man with only one hand visible. The observer will assume that the person in the painting has the other hand even though it is not depicted, rather than thinking the person is crippled. This addition of the "missing part" belongs to the mental tendencies of the logical continuity of the "organic-functional unity of the existing reality." On the other hand, a work of art is a unity in itself, that is expressed through the intuitive impression of the artistic representation.[138]

Based on the abovementioned, Brandi makes two conclusions:

1.   "*A work of art that does not consist of separate pieces, when physically fragmented, will continue to potentially exist as a whole in each of its fragments. This potentiality will be achieved in direct connection with what is left of the original artistic expression in each of the fragments of the disintegrated matter.*"[139]

2.   "*If the 'form' of every single artwork is inseparable, in the cases where the artwork is materially separated, one must try and develop original potential unity that every fragment contains, in proportion with the level of preservation of the original shapes of the fragments themselves.*"[140]

Bearing in mind these two conclusions, as well as the aesthetical and historical demand, it is the task of the restorer to determine up to which point the reestablishing of the original potential is possible. The threat of this action can be found in the second axiom of restoration, which states that "*restoration should tend to reestablish the potential unity of an artwork only if it is possible without creating artistic or historical forgeries.*"[141] The restoration of the potential unity is possible only when it is suggested by the fragments themselves. Otherwise, a forgery is created because both the historical and the aesthetical aspects are violated. To avoid such mistakes, three principles have been drawn:

---

[137] Ibidem, p. 44
[138] Ibidem, pp. 44-45
[139] Ibidem, p. 45
[140] Ibidem, p. 45
[141] Ibidem, p. 39

1. The first one states that any reintegration must clearly differ from the original. This, of course, shouldn't bother the observer when he/she is looking at the object from a distance. However, as soon as he/she approaches the object the difference must be clear.

2. The material used in the production of the artwork cannot be substituted if it belongs to the domain of the aspect. On the other hand, if it is part of the structure, then it can be replaced, but always in "harmony with the historical demand."

3. Every intervention must not be irreversible and should allow for easier interventions in the future.[142]

Even though these three principles constitute the main part, the biggest importance is given to the problem of the lacunae and the retouching, or rather painted reintegration. I will not be describing the whole problem of optical perception of the lacunae, just the general rule that applies to re-envisioning the missing parts. Two moments are considered absolutely unacceptable in restoration: *restoration based on imagination* and *restoration based on analogy*.

The first one is considered by Brandi literally as heresy, for it employs creativity that allows a person to interfere with the original artistic potential, aesthetical and historical demand.[143] It openly disrespects the artwork and the artist, because it tends to meddle with the chronology, and thus fake the "life" of the object. The problem of the analogy is somewhat similar. Regarding the restoration based on the analogy, its rejection can be found in the problem of perception of the artwork. If we remember that the mind with its logical approach tends to add the missing parts because it equates the depicted with the organic-functional reality, we come to the innate need for the analogy. This analogy is based on the semantic interpretation of the motifs depicted which counters the intuitive unity of the artwork. The example of the man with only one hand depicted should be kept in mind. A restorer cannot add the missing hand following the analogy of the mind. To quote Brandi once again: "the treatment based on the analogy demands the principle of equating the intuitive unity of the artwork with the logical unity of our perception of the existing reality. This is rejected."[144]

---

[142] Ibidem, p. 46
[143] Ibidem, p. 52
[144] Ibidem, p. 46

In September 1961 on the 20th Congress of art historians in New York, Brandi posed a question of the legitimacy of painted reconstruction and its relation to the potential unity of the original.[145] The answer he provided is somewhat flexible. Even though he personally states that this goes beyond the boundaries that were set at the beginning of the discussion, he also adds that the final attitude towards this problem is individual.[146] The only reintegration of which he approves, but still with a very rigid approach, is that of the "connecting elements that can be reconstructed based on the special *metalogic* that the artistic representation has, and which the context of the representation allows without possible alternatives. Here, too, it is only allowed on a case-by-case basis."[147]

The last term that I will present regarding Brandi's theory is reconstruction. It is defined as a tendency to "reshape the artwork, intervene in the creative process in a way similar to that of the original creative process, canceling or rather minimizing the time interval that separates the two moments of activity."[148] This process of minimization of the time span is achieved in two possible ways. The first one is understood as a forgery, for the reconstruction tends to be as similar as possible to the original period. In the second one, the reconstruction tends to encompass the original structure in itself. Unlike the former, the latter is acceptable as it becomes a testimony of contemporary practice and human activity, but, it must be noted that this type of reconstruction does not belong to the domain of restoration.[149]

Brandi's ideas were crucial for the development and systemizing of the restoration practice. At the Second International Congress of Architects and Technicians of Historic Monuments in 1964, the famous "Venice Charter" was formulated. "The charter consists of 16 articles and defines the principles of the methodology of architectural restoration… Here, the restoration is defined as a 'highly specialized operation. Its aim is to preserve and reveal the aesthetic and historic value of the monument and is based on respect for original material and authentic documents. It must stop at the point where conjecture begins, and in this case, any extra work which is indispensable must

---

[145] This was part of his paper "Theoretical Notes on the Treatment of the Lacunae" that was presented at the 20th Congress of art historians in New York, 1961. This text, including a few others is included in the Appendix of the Serbian edition of his Theory of Restoration.

[146] Ibidem, p. 85

[147] Ibidem, p. 86

[148] Ibidem, p. 59

[149] Ibidem, p. 60

be distinct from the architectural composition and must bear a contemporary stamp. The restoration, in any case, must be preceded and followed by an archaeological and historical study of the monument'."[150] The influence of Brandi's ideas becomes apparent immediately. First, in the aesthetic and historic polarity that is preserved in the original material. Secondly, in the visibility of the difference between the original and the added part. The thing that is here emphasized more than in "*Teoria del Restauro*" is the relationship between history/archaeology and restoration practice. While Brandi criticizes the contemporary ideas in archaeological reconstructions, the Venice charter stresses the importance of collaboration between the two.

The combination of the two–Brandi's theory of restoration and the articles of the Venice charter–results in the five main principles of contemporary restoration practice:

1. *Respect for aesthetic and historic value*: The meaning, history, and authenticity of the cultural asset should be preserved.

2. *Compatibility*: It is necessary to know the material of which the cultural assets are made for a correct evaluation of the intervention and compatible materials to be used.

3. *Recognition of intervention*: It concerns the legibility of the original parts. Integrations should be recognizable.

4. *Reversibility*: Any material used in restoration should be removable in order to return the artwork to its original conditions, allowing for future restoration.

5. *Minimal intervention*: It is necessary to repair or conserve original parts rather than replace materials to maintain the historical value.[151]

I will not be going into a further elaboration of these principles since it would be either repetitive or would drift too far away from the topic. The main idea is that these five postulates serve as a basis for comparison with the digital/virtual restoration.

However, I must also add that the discipline of conservation and restoration has advanced since Brandi's theory and the Venice Charter. It has become truly interdisciplinary, involving

---

[150] E. Pietroni and D. Ferdani, "Virtual Restoration and Virtual Reconstruction in Cultural Heritage: Terminology, Methodologies, Visual Representation Techniques, and Cognitive Models," in: *Information*, 12, 167, 2021. https://doi.org/10.3390/info12040167, p. 2

[151] Ibidem, pp. 2-3

historians, archaeologists, scientists, architects, and "conservators specializing in a wide variety of fields as diverse as wall painting and mosaic conservation to site interpretation."[152] It also includes the aspects of communication and education, spreading into the domain of museology.

Museology: Understanding the Artwork as an Object

Even though the ideas of Cesare Brandi are philosophically postulated and logically argued, the very object onto which they are applied is shared with other disciplines and sciences. I am mainly referring to museology which has its own definitions, rules, theories, and practice. The aspect in which the restoration theory and museology overlap is the object itself, in this case, the artwork. In this chapter, I will present two main understandings of museology and their common goal that I will use to argue and theoretically support my proposals for practical and virtual solutions to the problems in the church of Santa Maria Assunta.

Both conservation and museology are concerned with the object of the past and its transmission into the future. The past, or rather history plays a key role. In his chapter, titled "*Digital Heritage: What happens if we digitize everything?*," H. Thwaites quotes Michael Crichton's novel "Timeline" to present the concept and power of history:

> "History is the most powerful intellectual tool society possesses. History is not a dispassionate record of dead events, places, and people. The purpose of history is to explain the present, to tell us why the world around us is the way it is. History tells us what is important in our world and how it came to be. It tells us why things we value are the things we should value and what is to be ignored or discarded.''[153]

Such understanding of the past is crucial for it affects and dictates how to treat its material (and immaterial) remains that have come down to us. Museology, but also many other sciences and disciplines study the past, and I will try to, more or less, tackle the main ones and present their impact on my proposals and conclusion for the virtual restoration.

---

[152] S. Quintero, M. and E. Rand, Introduction – Current Trends in Cultural Heritage and Documentation, in: *3D Recording, Documentation and Management of Cultural Heritage,* ed. E. Stylianidis and F. Remondino, Dunbeath, 2016. p. 4

[153] H. Thwaites, "Digital Heritage: What Happens When We Digitize Everything?" in: *Visual Heritage in the Digital Age,* ed. E. Ch'ng, V. Gaffney and H. Chapman, London, 2013. p. 328

Museology has two dominant ways in which it can be viewed and defined. The first one understands it as a philosophical discipline. "Museology is the philosophy of the museum and has two roles: 1) to serve science as a metatheory that has a documentary-emotional character and 2) to be the ethics that regulates every institution in charge of leading the intuitive concrete function of documentation, whether that institution has an official status of a museum or not."[154] Hence, according to Deloche, the role of museology is to document, both the objective and the intuitive aspect of the object. On the other hand, Ivo Maroevic defines it as "a part of information sciences that investigates the identification, protection, and communication of museality of material testimonies of culture and nature, for the sake of protection of human heritage and interpretation and transmission of its messages, as well as shapes of organized and institutionalized human operations, for the sake of achieving the abovementioned goals."[155] Unlike Deloche, Maroevic puts museology in the domain of informatics/information sciences. In a certain way, both aim at the same tasks of this discipline/science. The stress is always on the documentary aspect of the object within an institution that is in charge of preserving the heritage. "Heritage comprises a constantly changing collection of objects and symbols, a complexity of images, cultural artifacts, monuments and a varying assortment of ethnic customs that are significant and meaningful to us."[156]

A term in Maroevic's definition that might require further clarification is *museality*. It goes together with the terms of *musealia* and *muselisation*. *Musealia* is the object in the museum. According to Peter van Mensch, it is created through the process of *musealization*, while *museality* represents all the immanent or given characteristics of the object. However, this still implies a concept of separated or rather isolated heritage. What it further requires, according to Maroevic, is the context in which it will be put.[157] However, putting something in a new context implies that it needs to be taken out of its former context in the first place.[158] This is exactly what happens in a museum.

In the case of my thesis, the "museum" is the church of Santa Maria Assunta, which belongs to a specific kind of museum-like institution: *a cult church*. This sort of object is peculiar "in the

[154] B. Deloš, *Virtuelni Muzej,* trans. V. Pavlović, Belgrade, 2006. p. 119
[155] I. Maroević, op. cit. p. 92
[156] H. Thwaites, op. cit. p. 329
[157] I. Maroević, p. 10
[158] B. Deloš, op. cit. pp. 19-20

first instance" because of its "series of valuable artistic achievements that make of it a treasury of cultural heritage in which time and century-old values are piled."[159] The priceless aspect of such structures lies in the *in situ* quality of their content. Therefore, most of the artworks inside are still in their original places which serves as an invaluable source of information. This is especially important when bearing in mind Maroevic's statement that the "object is, without doubt, the element in the informational basis of human knowledge."[160] The objects that I am dealing with in my thesis, all belong to the domain of art. Therefore, art needs to be defined in itself, but also its relation to the museum.

The Trinity – Artwork, Museum, Medium

As we have seen in the previous chapter, Brandi accepts Dewey's definition of a work of art as something constantly equal to itself in its material aspect, whereas it is always realized as a work of art in the consciousness of the observer during his/her aesthetic experience.[161] This served its purpose as the philosophical foundation upon which Brandi based his theory of restoration. However, if we define art in this way, we fail to give it any further context regarding the museum/church. Therefore, I accepted Deloche's definition that explains art as "*a process of emotional experience caused by an artifact.*"[162] If this sentence is combined with Maroevic's understanding of an object as the basic information bearer that needs to be incorporated into a museum context, a trinity is reached. This trinity is composed of an **artwork**, a **museum**, and a **medium**.[163]

Hence, the **artwork** is the first part of the trinity. According to Sulcer, "we have invented art so that we can dress up paintings into thoughts and notions that have nothing material; in this new form they enter the senses and cross into the souls of the others."[164] Therefore, art, not just a

---

[159] I. Maroević, p. 255
[160] Ibidem, p. 11
[161] Ч. Бранди, p. 36
[162] B. Deloš, p. 19
[163] B. Deloche draws a rather interesting parallel between his trinity of the museum and the understanding of the Holy Trinity. "The Father (creator, art that causes an experience), the Son (manifestation of the experience of the Father–museum that presents), and the Holy Spirit (the medium–virtual). (B. Deloš, op. cit. p. 20)
[164] Ibidem, p. 27

painting but any other form as well, is created for the sake of communicating an idea. This idea is embedded in an artifact/object that needs to provoke an emotional experience in the viewer.

A very important point here is that the ideas that art holds in itself are representative of the time in which that specific object is created. They are also specific for the artist who made the object himself/herself. "In other words, it can be concluded that, due to the fact that Giotto, for example, painted compositions that are universally recognized as works of art and were during his time accepted as such, these works of art undoubtedly represent the epoch in which Giotto lived…"[165] To put it in the terminology of Maroevic, artworks have *museality* i.e. "the feature of an object to serve as a document of one reality in another, to document the past in the present."[166] The documentary role of art in a museum is therefore being extracted from its historic identity. "Time is present in the artwork in three different moments, regardless of the kind of artwork. In the first place, as *lasting*, during the manifestation of the artwork while it was being made by the artist," as Brandi puts it.[167] This is the first part of its historic dual-polarity. In a museum context, observed in a less philosophical way than that of Deloche, a painting is a document of the period in which it was created. It is the museum then, that needs to, through the objects/art, its exhibitions, and collection layout, represent "people, period, the context of life, and knowledge."[168]

Now I will turn to the **museum**, as the second part of the trinity. Even though its role can be inferred from the paragraphs above, I would still like to provide a definition. "It has a double role: 1) to present [the artworks] to the audience, for they [the artworks] shape its view through the emotion-stimulating experience that is being offered, and 2) to be able to carefully examine these artworks…"[169] To summarize this, the two main roles are communication through presentation and analysis. The artwork is there to cause an emotional response, to be absorbed by the viewer, while the museum, or in this case the Basilica of Torcello, gives it institutionalized support and status.[170] It serves as a place, a scenography in which the artifacts cause an emotional experience in the observer. The museum presents the object. That is why its role is so important. It preserves the emotional experiences of the artworks, allows them to communicate with the

---

[165] Ч. Бранди, op. cit. pp. 49-50
[166] I. Maroević, op. cit. p. 96
[167] Ч. Бранди, op. cit. p. 49
[168] I. Maroević, op. cit. p. 13
[169] B. Deloš, op. cit. p. 81
[170] B. Deloš, op. cit. p. 75

audience, and, as a consequence, it helps create a narrative. In a certain way, the museum itself is a work of art, for it, too, creates a visual and emotional experience in the observer. As Stransky puts it, we need to "find a way to express the abstract through the concrete."[171] This is much more obvious in the case of the church, for the very architecture itself poses as art, resulting in the evident overlap of the museum, art, and cultural heritage. This is illustrated in the graph below.

1. Problem
Preservation of the sacred

2. Problem
Documentation of the experienced

Other substitutes
(media, etc.)

Object
(sacred art/representation)

Museum
(safeguarding/presenting)
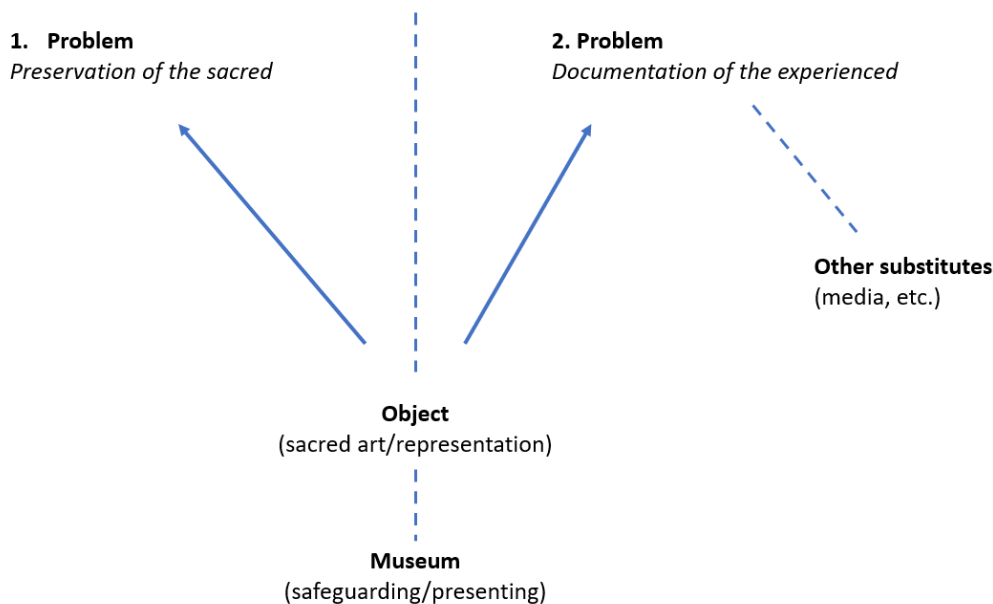
15 The graph has been taken from Deloche, p. 222 and modified to fit the concept of the thesis

Regarding communication and cultural heritage preservation, two main functions of the museum (communication and analysis), can be formulated in a better way. "*Communicational function* deals with dissemination and distribution of knowledge, and is expressed through the exhibition within a museum, that, as an imperative has the stamp of the contemporary period; an exhibition is always happening in the present, therefore it can be considered a form of stating new knowledge and presenting the knowledge accumulated and acquired in the museum… *The informational function* is directed towards the organization and selection of knowledge. It…accumulates the total knowledge created in the museum and acquired in museum objects, or

---

[171] I. Maroević, op. cit. p.168

rather accumulated in the heritage..."[172] These two functions, when united, form another key aspect: education.

Why education? If a museum is considered a place that preserves the sacred, it can be seen also as a place that worships the cult of man. As Andre Malraux says: "The museum is one of the places that offer the highest image of man."[173] We go to a museum to see this image of the past that affects the present. However, we cannot comprehend it without knowledge, and it is the role of the museum to educate us, to organize and sort knowledge in a systemized way for the observers to absorb. Without this, a museum would be a place that exhibits objects just for the sake of exhibiting them. In the case of Torcello, the educational aspect is one of the main issues. Unless a tourist is an expert in Venetian history or art, has a quality guidebook, or paid for a guided tour, there is no way he/she can know or understand the basilica or any of the art inside of it. This issue will be further addressed in the chapter dedicated to specific artworks and their respected problematics within the church.

The goal of education is to share or rather offer knowledge to museum visitors. This knowledge can be divided into two types. The first one is *formative*, while the second is *contextualized*. The former is primarily obtained from the object itself by extracting the information it holds as a document of the past, but also from the documentation of the object's properties as a result of studies and analysis. The latter is obtained in specific museum contexts such as an exhibition, depo, in the relation between two objects that otherwise wouldn't have been paired in any reality outside of the museum, etc.[174] It is the role of museology to mediate the two by selecting the information that will be presented. A parallel can be drawn here between Brandi's dialectics of restoration. Just like the role of the restorer is to balance between the aesthetic and historic demand of the object, so too the museologist balances between formative and contextualized knowledge. Obtaining information from an object requires time. Four different times can be distinguished. These are: *communicational, documentational, informational*, and *historical*. The first one implies contact with the object in a museum and the message it conveys. The second one makes the object accessible as a document in direct contact making it easier to research and investigate. Informational time is the research time applied to secondary

---

[172] I. Maroević, op. cit. pp. 112-113
[173] B. Deloš, op. cit. p. 220
[174] I. Maroević, op. cit. p. 113

documentation i.e. restoration data, catalogs, books, and other publications, etc. The last one, the historical time, is crucial for reconstructing the life of the object. It investigates the material and social impact of the past on the object.[175]

To summarize the information presented regarding the time, knowledge, and exhibition/communication, I have added a graph below this paragraph. On the left, it shows the depiction of knowledge, or rather the ideas of the past. This first part corresponds to Brandi's idea of time in relation to a work of art: the moment of creation and the series of "presents" through which the object existed and was carried into the present. This leads to the middle part, which covers the contemporary period, in which the object serves as a statement of knowledge accumulated in the past. This knowledge gathered in the present serves as documentation that is transmitted into the future, implying that in the future it will also serve as a document of the past. Hence, the graph shows a dynamic process of the constant emission of information from the object
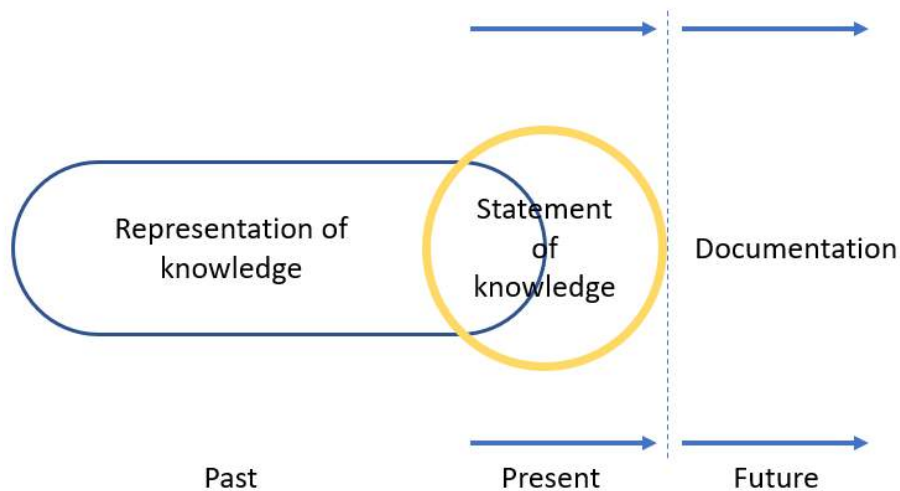
16 The graph has been taken out of I. Maroevic's "Introduction to Museology", p. 116

and the interplay between the three different times.

Getting back to Deloche's trinity – **artwork**, **museum**, **medium** – the first two have been explained and covered. Now, I will turn to the third one, the **medium** that serves as a tool for expressing and visualizing the relationship between the former two. I have stated that when an object is exhibited in a museum, it is taken out of its primary context and put into a new one.

---

[175] I. Maroević, op. cit. p. 116

Deloche refers to this as an empirical solution, and stresses the importance of turning back to the problem – in which context will this object be put? Therefore, virtualization is understood as "the process of transitioning into the problem, decontextualization or manipulation of the artifact."[176] In other words, it "allows the transition of the given problem…into other possible solutions."[177] When a digital version of an object is made, it allows for innumerable changes to be made, in contrast with the one in the material reality, that, when once altered, permanently remains as such. The purpose of a virtual reconstruction is to introduce the past to the present. "The Past can be viewed as the most virtual reality that we contend with. It is the ghost of a once-lived reality surviving in fragments that can only be experienced in hindsight. The past can never be re-created as it was and thus our fascination and dedication to come as close as we can to re-presenting it to contemporary audiences via digital heritage applications."[178] With this understanding, we enter the domain of **digital heritage**.

The ability to create multiple different versions perfectly coincides with the ability of art to "describe the world of imagination," or put in one term "heterogenesis."[179] This phenomenon, or rather this need to animate the past can also be termed "electrification of imagination," as it allows for the viewer to come in contact with that which is otherwise impossible to see and experience.[180] For example, one can make several versions of the Torcello basilica in each of its periods. These digital models can then be filled with people, reproducing life in the 7th or 11th century. Thus, "digital heritage can be considered to comprise facts and information (architectural plans, 3D scans of heritage artifacts or sites, photos of locations, etc.), fiction, interpretations, or 'best guess' (re-creations of landscapes, people, building adornments, etc.) and fantasy (highly engaging for the audience) in varying forms and degrees with interpretive narratives of the past."[181]

Therefore, the museum is used as a place in which an object can express its museality and is able to serve as a document of the past in the present. The object, in this case, a work of art, was made in the first place in order to capture and express an abstract idea through the shaping of the matter. Presenting it in a museum implies the change of its primary (or archaeological) context,

---

[176] B. Deloš, op. cit. p. 20
[177] B. Deloš, op. cit. p. 136
[178] H. Thwaites, op. cit. p. 329
[179] B. Deloš, op. cit. p. 25
[180] H. Thwaites, op. cit. pp. 335-336
[181] Ibidem, p. 336

forcing a new solution in creating a stimulative surrounding for its documentary character. This solution represents the virtualization of the object, regardless of whether it has a digital copy of itself or not. Trying to summarize this chapter, and connecting this short presentation of the virtual with the other two aspects of the trinity, leads to the conclusion that museums, objects, and the virtual are just different means of documenting reality.

Virtual: Original-Copy

Philosophically speaking, virtualization is not opposed to reality, but to the actual. It objectively exists in another medium, the digital, and represents the potentiality of the object. "Virtuality, as such, has the full reality," according to Deleuze.[182] When an object gains its virtual versions, it gains different equivalents of itself that are real and have the potential to be materialized. We can easily switch between each of these versions, thus having a fuller picture and understanding of the starting object.[183] Here, another key aspect of the virtual opens – the relationship between the original and a copy.

The best-known theory regarding this phenomenon is that of Walter Benjamin, which he explained in his most famous work titled "*The Work of Art in the Age of its Mechanical Reproduction*." In it, Benjamin presented the concept of the aura of the original which is experienced when in contact with the work of art. According to W. Benjamin (mass) reproduction disperses the artistic aura of the original, which is exclusively tied to its ritual purpose.[184] The divide between the material object which is regarded as an authentic, original, or objective, and the digital copy, which is often referred to as a surrogate, a reproduction, or ephemeral originates in the empirical school of thought in the 19th century. The emphasis on the original material is also stressed by Benjamin. In the 60s and 70s of the previous century, "epistemic relativism" was developed thanks to the rise of postmodernism. According to it, the "objective" is being recognized as a social construct, and therefore, the material object itself becomes open for various

---

[182] B. Deloš, op. cit. p. 128
[183] B. Deloš, op. cit. p. 127
[184] V. Benjamin, "Umetničko Delo u Veku Svoje Tehničke Reprodukcije," in: *Studije Kulture,* ed. J. Đorđević, Belgrade, 2008. p. 106

interpretations.[185] According to Lev Manovich, we are currently living in an era of "post-media," in which "synthetic computer-generated imagery is not an inferior representation of our reality, but a realistic representation of a different reality."[186] As a consequence of such observation, the digital object achieved its full autonomy. Even though their appearance is that of a copy, their essence is equally authentic as that of any other material object in its own right. Still, the value of the digital in the eyes of the observer stems from the observer's acceptance of the material counterpart as authentic. This is further strengthened by the museum as institutional support for both the original and the copy.[187]

However, the point is not just to digitize something, but to create "a parallel testimony" between the material original and the virtual copy. As nice as this might sound, there is another theoretical problem of understanding the virtual. These equivalents that are paradoxically unequal to the starting material object are actually self-referent images, or at least have a tendency to become. The real danger of the virtualization of an object used in a museum context (bear in mind the educational aspect) is the annihilation of the referential aspect, leading to a simulacrum. As a consequence, the parallel testimony is lost.[188] The charm of digitalization, however seductive it may be, should be resisted. All the possibilities offered by the process of digitalization arise from the concept of structural information that "allows for an object to be studied for it discovers its contextual boundaries."[189] The idea that digital copies and models are connected to museological purposes must always be kept in mind. This leads to a paradox in which the material object, which depends on relative social interpretations, is now, in relation to the digital copy regarded as (more) objective truth.[190] What further increases this danger is the usual lack of the material object, or in other terms – the subject of the digital. By this, I am referring mostly to the archaeological remains that survive in often illegible fragments. When making a virtual reconstruction, we are not making a copy of the existing, but a simulation of the non-existing. "Subjection, in short, is a grand illusion.

---

[185] F. Cameron, "Beyond the Cult of the Replicant – Museums and Historical Digital Objects: Traditional Concerns, New Discourses," in: *Theorizing Digital Cultural Heritage,* ed. F. Cameron and S. Kenderdine, Massachusetts, 2007. pp. 52-54

[186] Ibidem, p. 54

[187] Ibidem, p. 56

[188] M. Popadić, *Čiji je Mikelandjelov David? Baština u Svakodnevnom Životu*, ed. D. Bulatović, Belgrade, 2012. pp. 49-50

[189] M. Popadić, *Diskretni Šum Peščanika: Baština i Njene Nauke*, ed. N. Krstović, Belgrade, 2021. p. 151

[190] F. Cameron, op. cit. p. 58

There is no subject, because the subject traced back in projection [i.e. a digital/virtual version] is already dead."[191]

Another crucial aspect that is often misunderstood is the materiality of the digital. "The analog media of the past stored cultural information in the material of physical objects. Digital media store it as formal relationships in abstract structures of zeros and ones. You cannot 'see' digital content in the same way we can see an image on a strip of 35 mm film or a photo negative, both of which are quickly becoming dead media. Our current ability to digitally model a heritage environment makes abstract coordinate space become object space while the computed information becomes the image space."[192] Hence, the digital cultural heritage is not opposed to objects as immaterial is opposed to the material, rather, its materiality is just realized differently. These different realizations are actually "unstable processes which, even as 'static' displays, are the results of continuous and ongoing computations."[193] A fine example of the duality of the matter is the case of Michelangelo's *David*. The original sculpture is made of marble and has its own physical and chemical properties that are changing due to the impact of various factors. The digital copy of it consists of a numerical inscription of 0s and 1s. "Its sculptural form is defined by a mathematical function with its media elements—shapes, colors, or behaviors—represented as discrete samples (pixels, polygons, voxels, characters, and scripts)… The means of production — the computer — also becomes the means of distribution."[194] Both objects are material objects. The main difference is that the material one is fixed, while "the digital David is no longer semantically and aesthetically discrete, can exist in potentially infinite versions, and be distributed in space and time due to its numerical coding and modular structure."[195]

The best, and probably the most complex digital tool that is available to us is virtual reality (VR). Since VR cannot be realized without the headset that the viewer needs to wear, the person becomes a slave to the machine.[196] Through telepresence, this dependence on the machine allows him or her to see the object, or in this case, the artworks, which are physically very distant: "The

---

[191] S. Cubitt, "Projection: Vanishing and Becoming," in: *MediaArtHistories,* ed. O. Grau, Massachusetts, 2007. p. 417
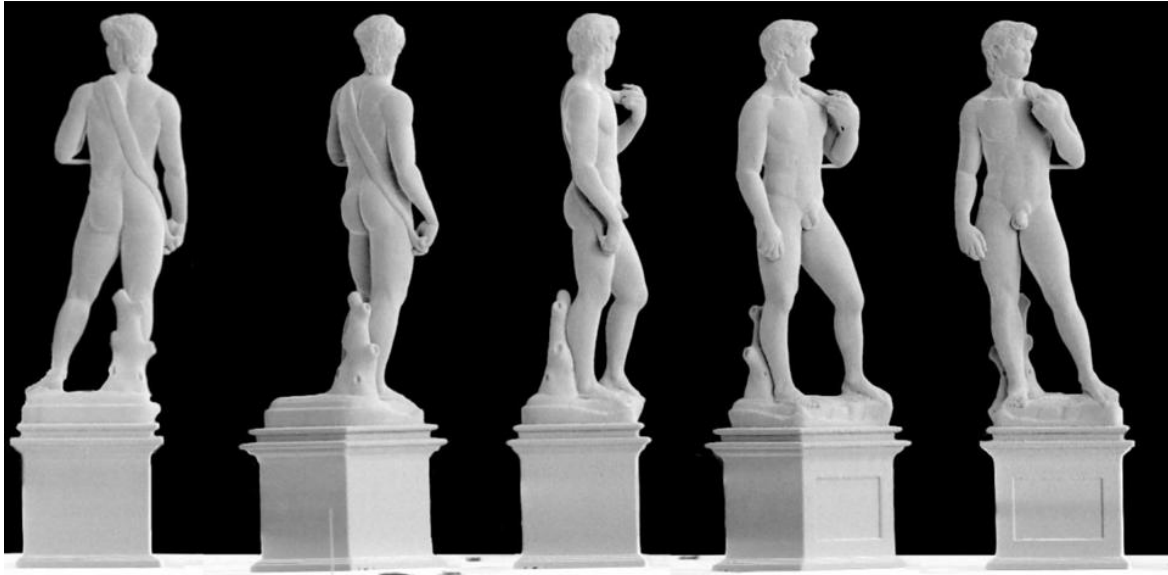
[192] H. Thwaites, op. cit. p. 335

[193] A. Broeckmann, "Image, Process, Performance, Machine: Aspects of an Aesthetics of the Machinic," in: *MediaArtHistories,* ed. O. Grau, Massachusetts, 2007. p. 196

[194] L. Manovič, *Jezik Novih Medija*, Belgrade, 2015. p. 72

[195] Ibidem, p. 72

[196] L. Manovič, *Metamediji*, Belgrade, 2001. p. 14

17 Digital replicas of Michelangelo's David

classic position of an observer directly in front of a material work of art was replaced by a participatory relationship that surmounts great distances but still appears to be immediately present in the work."[197] He or she no longer needs to go to a museum, church, or gallery but can access them from his home, provided that all of the technical requirements have been met.

For example, VR of the basilica in Torcello is one such context. In it, the whole space as well as the artwork itself, are presented in predetermined circumstances. These circumstances transform the "ritual" aspect of the church into a mass-accessible digital version. Three main problems resulting now are the decrease of *aesthetic distance, the extrapolation of the artwork from its original context, and the inconsistency between the real and virtual experience.*

1) The first problem is the so-called *aesthetic distance*. It "always comprises the possibility of attaining an overall view, of understanding organization, structure, and function, and achieving a critical appraisal."[198] Increasing the level of symbiosis between the observer and the illusion decreases this distance proportionately. As a result, a feeling of real presence within the virtual is achieved, but the critical understanding of the artwork is diminished.

---

[197] O. Grau, *Virtual Art: From Illusion to Immersion*, trans. G. Custance, London, 2003. p. 271
[198] Ibidem, p. 202

2) *Extrapolation of a work of art from its original context* by the means of digitalization refers to a shift that consequentially appears in the relationship between the viewer and the object. "The classic position of an observer directly in front of a material work of art was replaced by a participatory relationship that surmounts great distances but still appears to be immediately present in the work."[199] He no longer needs to go to a museum, church, or gallery but can access them from his home, provided that all of the technical requirements have been met. These technological requirements refer to "a spatio-temporal coordinate" of the artwork now. The reproduction, even a virtual one, cannot accurately capture the "unrepeatable existence in a place where" the original "is located."[200] The location of the reproduction is, in this case, in the domain of the digital i.e. it is being stored as digital data. The paradox of mass reproduction by means of digitalization is the fact that anyone can reach it even though there is only one link for the website. Unlike a newspaper or a print, for which every person has a different material object (albeit with the same content), in the case of VR on a webpage the whole world can access it through the same link. The artwork has thereby become de-materialized.

3) Lastly, the former two result in the *inconsistency between the real and the virtual experience*. This is obvious since the virtual version shows "an idealized" museum setting. As described earlier, the situation within the digital version is predetermined. It is also constant and unchanging and as such not a faithful reproduction. The person watching it from home (whether through a computer or a headset) will have a hard time enjoying it the same way in real life due to the presence of tourists or meteorological impacts. However, with the advancement of technology, this inconsistency can be significantly decreased.

Virtual can thus be understood in its dual meaning: on one side as any means or tool used for decontextualization or manipulation of the object (following R. Deloche), on the other as literal digitalization of the object, on which further manipulation can be done. This issue will be discussed more in detail in the part of the thesis related to the case studies inside the basilica.

---

[199] Ibidem, p. 271
[200] V. Benjamin, op. cit. p. 103

The problem of the virtual copy in relation to the original and its aura is not done. Grau concluded that "computers" in which the digital models are stored, "may be the best repository of all time for information, but they are unable to record or reproduce the sensual presence of a material work of art."[201] With the advancement of technology, digital objects can in fact reproduce the experiential and the sensual[202], but this, however, requires other hardware than computers. The question of the aura is brought into the spotlight again. If we accept that the reproduction severs the aura from its original context, thereby making the artwork itself more accessible to a much wider audience, and allowing it to be placed in contexts that otherwise would have been impossible for the original,[203] a new question can be posed. Does digital reproduction have its own aura? One of the personal remarks in Benjamin's theory is that he failed to see that photography, which at that time was a new medium, will eventually obtain its aura of originality with the passing of time and the arrival of new, more superior media. Nowadays, looking at a photograph made in the 50s, we want to know how, why, and when was it made? By whom? Answering these questions proves that it had its own life as any other museum object. Therefore, it has its own aura. What about the digital? Do digital objects such as a virtual reconstruction have their aura, or will it be realized when a more advanced medium is created?

The answer lies perhaps in the aesthetic of the digital. According to Benjamin, the aura is associated with the ritual function of the artwork, and this cannot be reproduced.[204] That is why, when a reproduction is made, the original ritual aspect is lost, and hence, the copy is deprived of the auratic characteristics. What happens if a particular medium can reproduce the ritual? At the time of Benjamin, this was not possible. However, in the 21st century, such ideas are no longer in the domain of hypothetical or imagination. Virtual reconstruction with immersion and telepresence is precisely the tool that allows for the enactment and participation in a ritual. The very aesthetics of the virtual depend, "to a large extent, on nonvisual aspects, such as narrativity, processuality, performativity, generativity, interactivity, or machinic qualities."[205] The immersive reconstruction can "include various non-material aspects such as symbolism, ideology, and ritual; a concern with the social and abstract dimensions of heritage, ceremony, and the creative use of aesthetic objects

---

[201] O. Grau, op. cit. p. 207
[202] F. Cameron, op. cit. p. 54
[203] V. Benjamin, op. cit. p. 104
[204] Ibidem, p. 106
[205] A. Broeckmann, op. cit. p. 196

and ceremony."[206] The fact that it depends on interactivity and can include non-material and symbolic features, allows for a reproduction of the ritual. Even though Benjamin's unreproducible aura of the original is lost, the immersion into a virtual ritual means that the observer experiences the (digital) object. He or she is lost in the simulation,[207] allowing me to conclude that the virtual reconstruction indeed has its own aura. The fact that a digital object is an autonomous object in its own right makes it at the same time auratic. Denying it of its aura stems from "the lack of understanding of its materiality, and thus denies the surrogate" of its "history and provenance."[208]

Another important aspect that counters Benjamin's theory is that the very fact that a reproduction of an object is needed or required, gives importance to that object. Copies of cultural heritage are not made because someone has more spare time and resources, but because something is recognized as authentic, valuable, and important. Making a digital replica requires curatorial skills and a decision-making process that will select the information that will be visualized and presented to the public.[209] As a consequence, an autonomous object is created with its own history, aesthetics, purpose, and narrative.

---

[206] B. Flynn, "The Morphology of Space in Virtual Heritage," in: *Theorizing Digital Cultural Heritage*, ed. F. Cameron and S. Kenderdine, Massachusetts, 2007. pp. 353-354
[207] Ibidem, p. 362
[208] F. Cameron, op. cit. p. 67
[209] Ibidem, p. 57

Virtual Restoration

In the previous chapters, the basic terminology of Brandi's theory has been explained, its connection to museology, both as a philosophical discipline and an informational science has been elaborated, and the trinity consisting of museum-artwork-virtual was presented. On top of that, I have also presented a detailed explanation of the theory of virtual and its relationship with the material object, explaining the concept of the aura. I have organized the previous chapters in a way that after connecting these elements, they can serve as a basis for explaining the digital/virtual restoration.

Before going into its definition, the digital object itself must be defined first. "It can be a reproduction of a physical artifact, or it can be natively digital. The digital object, if limited to the reproduction of a real object, becomes a replica, if it is obtained through criteria and methodologies that guarantee fidelity and accuracy both at the topological/metric level and at the surface properties level. In this sense, the digital replica becomes a transmitter of information and allows the preservation of the knowledge of the object, even if the real original is lost."[210] This definition given by E. Pietroni and D. Ferdani encompasses all the key aspects explained in the passages above: reproduction or natively digital (model), based on information accumulated within the object as a document, transmission of information, creating knowledge, and creating a digital testimony/patrimony. All of these characteristics of the digital object should be kept in mind in the further discussion because they serve as firm connectors with the previous paragraphs.

There are two distinct approaches to the use of new media in museums. The first one sees the digital as a threat to the original object. It decreases the role of the material artwork, diminishing its authority. As a consequence, museums and curators become a thing of the past, a reminder of the previous traditions and approaches to museology. On the other hand, the use of new media and technologies can enhance communication with the audience, stimulate the

---

[210] E. Pietroni and and D. Ferdani, op. cit. p. 1

observers, and renew the function of the museum.[211] Personally, I am closer to the second approach but with a certain degree of caution which is a consequence of the previously explained concepts.

The idea behind digital heritage is not just to document and keep objects of cultural heritage in a repository of information, but to contextualize it. That is why the term virtual, understood as a recontextualization of an object is highly applicable here. When put into this new situation, a digital model can serve for representing abstract ideas and concepts that help recreate the past and present it to the viewer. In this way, the goal of obtaining knowledge and disseminating it is achieved. Thus, both the *communicational* and *informational functions*, as defined by Maroevic are covered.

The transmission of knowledge through information and communication is achieved in experiencing the virtual. The viewer needs to be intrigued by it in order to develop critical thinking and understanding, in this case, of the past. "Hence, the goal of a virtual process is to increase perceptual and cognitive levels, reactivating spatial-temporal relationships and meanings of the cultural object. The virtual dimension facilitates the mental process of imagination, giving shape to an abstract concept (a vanished ancient context cannot be perceived and experienced), making legible and recognizable what the visitor is often unable to 'decode,' identify, and contextualize."[212] VR serves as the best illustration of this description as it stimulates mental immersion that is governed by the predetermined programming of cyberspace.[213] One such project was Loeffler's Temple of Horus, the Egyptian deity, that the viewer could visit and explore in the virtual domain[214], or the famous 11th-century monk's visit of the Cluny Abbey presented in 1993.[215] Another example is the Forum of Augustus from 2019, which recreated the appearance

---

[211] A. Witcomb, "The Materiality of Virtual Technologies: A New Approach to Thinking about the Impact of Multimedia in Museums," in: *Theorizing Digital Cultural Heritage*, ed. F. Cameron and S. Kenderdine, Massachusetts, 2007. p. 35

[212] E. Pietroni and and D. Ferdani, op. cit. p. 2

[213] O. Grau, op. cit. p. 336

[214] O. Grau, op. cit. p. 174

[215] P. Boniface, *Managing Quality Cultural Tourism*, New York, 2003. p. 87 "An early exhibition of digital technology applied to a heritage recreation was staged at the Imagina Conference in Monte Carlo in February of 1993. It showcased a real-time guided tour of a digital reconstruction of the Cluny Abbey, a building that has not existed for centuries. Following from that event 1995 saw the first Virtual Heritage conference held at the Assembly Rooms in Bath, UK. It showcased such projects as Virtual Pompeii, Virtual Lowry, the Caves of Lascaux, Palace of Ashur-nasirpal II, Nimrud, Assyria modelled in 1999 by Learning Sites, and the Fortress at Buhen, Egypt. Many heritage applications continued to emerge built on the work done in Japan at the Virtual Systems Laboratory at Gifu University including the VSMM (1995) International Conferences that followed each year from the first in Gifu Japan in 1995 and onwards." (H. Thwaites, op. cit. p. 330)

of the 1ˢᵗ century AD temple with its surrounding buildings (image below). The VR headset allows for the viewer to take on the role of the forum guard and perform tasks and activities, gaining knowledge of that period in the process.[216] This immersion is achieved when the machine, that is the headset, the virtual, and the sight unite in an indistinguishable entity. As a result, the consciousness of being present in the virtual realm is turned into unconsciousness, i.e. the medium becomes temporarily invisible.[217]

18 Virtual reconstruction of the Temple of Mars Ultor. The reconstruction is modeled and rendered on the digital replica of the site. This kind of visualization allows the recognizability of the original structure. (Virtual restoration, 23)

Speaking of a digital object which is just a copy of the material original, a fine example is that statue of Zeus (or Poseidon) from the National Archaeological Museum in Athens. The original "is retained in the ritual space of the museum, whereas the patterns and codes of the digital Zeus do not have a materially conserved quality, are not subject to wear, and have a ubiquitous, nonexclusive quality. For example, Zeus has been put into situations not available to the 'real' in a way that photographs were previously. These are now accessed locally in the exhibition *1000 Years of the Olympic Games*, and dispersed through the Web site."[218]

---

[216] E. Pietroni and and D. Ferdani, op. cit. p. 23
[217] O. Grau, op. cit. p. 340
[218] F. Cameron, op. cit. p. 66

Comparison with the Postulates of Practical Restoration

Just as Brandi's "Teoria del Restauro" and the Venice Charter were influential in defining the postulates of practical restoration, so too the digital/virtual had its own rules. Since new technologies are always seductive with the almost-infinite amount of possibilities that they offer, certain regulations had to be made. This was done as a sort of guarantee and prevention of excessive reconstructions. Let's remember the risk of a model becoming self-referential and losing all ties with its material counterpart, resulting in a simulacrum. The London Charter emphasized the importance of documentation, not just the one used in creating a virtual model, but also to try and document the process of model production. "Sufficient information should be documented and disseminated to allow computer-based visualization methods and outcomes to be understood and evaluated in relation to the contexts and purposes for which they are deployed."[219] The stress is now on *paradata* that is defined as a document of the intellectual process, as opposed to *metadata* that "describes observational technicalities such as equipment settings, data ownership, hardware, and software."[220] The London Charter was followed by the Principles of Seville that "aim to build a clear and rigorous basis for presenting cultural heritage virtually."[221] The former one stresses the need to distinguish the "real, genuine, or authentic" from the additions and reconstructions. The latter addresses the same issue as the London Charter by pointing out the need to "gather and present transparently the entire work process."[222]

This work process consists of an interdisciplinary approach in which several professions cooperate. The most important ones are museology, history, archaeology, history of art, and computer science. The last one serves as a point of connection for the previous ones, as well as a realization tool. The process consists of a survey, documentation, data processing, creation of the models, and source mapping/transparency.[223]

---

[219] E. Pietroni and and D. Ferdani, op. cit. p. 9
[220] A. Watterson, "Beyond Digital Dwelling: Re-thinking Interpretive Visualization in Archaeology," in: Open Archaeology, 2015; 1, p. 122 https://www.degruyter.com/document/doi/10.1515/opar-2015-0006/html?lang=en
[221] M. Silver, "Conservation Techniques in Cultural Heritage," in: *3D Recording, Documentation and Management of Cultural Heritage*, ed. E. Stylianidis and F. Remondino, Dunbeath, 2016. p. 21
[222] E. Pietroni and and D. Ferdani, op. cit. p. 9
[223] Ibidem, pp. 9-10

- The **survey** represents the gathering of information from objects using various "image-based and range-based technologies."

- **Documentation** is used for the so-called philological approach. It implies the usage of all available information, both bibliographical and visual for further study of the object.

- **Data processing** is the third phase in which the gathered information is analyzed, discussed, and then used to propose a suitable model that will be representative of the accumulated knowledge.

- **Model creation** occurs simultaneously with the previous phase since the final result should depict not just the visual aspect of the object, but also its use and purpose. Therefore, when making a model, the team must rely on all the data acquired and try to represent it. Even though 2D models are impressive, they often don't provide enough information. Unlike them, the 3D models, as a result of computer graphic advancement, allow for a better representation and further manipulation in various applications.[224]

- **Source mapping and transparency** are connected with the previous two points. The importance of this last step lies in the need to have a clear representation of what is original and which parts of the 3D or 2D model are invented.[225] As was stressed earlier, transparency is very important because usually, the final models are put online and, as such can be visited from any place in the world. On the other hand, "quantification and transparency ask for order, conformity, systematic process and repeatability, but these attributes are not often feasible or desirable within visual research practice."[226] Therefore, a compromise between the two needs to be achieved.

Now that the basic aspects of virtual restoration have been explained, a comparison with the practical one can be done. I will list the main principles according to Cesare Brandi and the Venice

---

[224] M. Popadić, *Diskretni Šum Peščanika*, p. 150
[225] E. Pietroni and and D. Ferdani, op. cit. pp. 10-11
[226] A. Watterson, op. cit. p. 123

Charter in the same order as they are listed in the previous chapter, and after each, the relation between virtual restoration and this principle will be stated.

Respect for aesthetic and historic value: Virtual restoration, objectively speaking, has no contact with the original aesthetic and historic value of the object. This is because it works on the digital copy located on a computer. However, since the copy is connected to the material object, being its "dissimilar equivalent", the changes made on it should be carefully thought through. *Compatibility*: It is necessary to know the material of which the cultural assets are made for a correct evaluation of the intervention and compatible materials to be used. The practice on the virtual model has no connection to this principle since all the interventions are "made" or "consist" of the same digital "matter" as the model itself. *Recognition of intervention*: It concerns the legibility of the original parts. Integrations should be recognizable. The same applies to virtual restoration. This is emphasized both in the London Charter and the Principles of Seville and is formulated as the last part of the process of model creation – source mapping and transparency. *Reversibility*: Any material used in restoration should be removable in order to return the artwork to its original conditions, allowing for future restoration. In the virtual domain, this principle holds no importance as all the models can be reworked as many times as needed or wanted. However, it would be good to have all the previous versions saved for the sake of documenting the creative process to demonstrate the information/theories/approaches that were popular in the moment of model-making. *Minimal intervention*: It is necessary to repair or conserve original parts rather than replace materials to maintain the historical value. This is somewhat debatable as it entirely depends on the purpose of the model and the idea behind it.

Therefore, virtual restoration, in general, is not connected much with the principles of practical restoration except for the "recognition of intervention" and "minimal intervention" (that depends on the purpose of the model). On the contrary, it can be stated that it is quite complementary to its practical counterpart. It allows for all the possibilities that in material reality are otherwise impossible, because "all actions have no consequences for the original cultural object."[227] Hence, virtual restoration proves to be a quite potent tool for the presentation and communication of cultural heritage. "The virtual reconstruction in fact, through special presentation and simulation tools, improves cognitive processes by making it easy for anyone to

---

[227] E. Pietroni and and D. Ferdani, op. cit. p. 3

understand the historical and archaeological data represented and transforming the raw data into information."[228] This is the precise goal of museology and the tool for larger accessibility to cultural heritage, resulting in its increased popularity and relevance in education through various digital models. To create them, the technicians need to enter a sort of a creative or rather artistic process. However…the concept of 'art' has been poorly defined and consequently the perception of its use is varied, often being thought of as 'good to look at' as opposed to being 'goo to think with'."[229] This opens up a new set of problems related to digital models and the "artistic freedom."

Reconstruction Problems

This problem has been addressed in the previous paragraphs, but I would like to summarize it and present it in a more cohesive way with certain additional issues that can occur.

Getting back to Brandi, two statements are crucial for presenting and understanding the main advantage and, at the same time, the main risk of virtual restoration. The first one states that "*restoration should tend to reestablish the potential unity of an artwork only if it is possible without creating artistic or historical forgeries...*"[230] The second one states that "*if the 'form' of every single artwork is inseparable, in the cases where the artwork is materially separated, one must try and develop original potential unity that every fragment contains, in proportion with the level of preservation of the original shapes of the fragments themselves.*"[231] One should bear in mind Brandi's argument against retouching based on analogy because it follows the logical continuity of the "organic-functional unity of the existing reality." However, the main reason why we are using virtual reconstructions and 3D models is, precisely, because they allow us to overcome this issue. Let us remember that the digital model is only an unequal copy of the original in another medium and can be reworked a multitude of times.

The logic of virtual restoration can be partially identified with the "stylistic restoration" that is deemed unacceptable by today's standards. "This 'total retouch' is possible only in a virtual

---

[228] Ibidem, p. 11
[229] A. Watterson, p. 121
[230] Ч. Бранди, op. cit. p. 39
[231] Ibidem, p. 45

environment, since it only involves a digital edition of the artwork without damaging the original, especially when restoring the original in its integrity is impossible…This approach is also called 'virtual iconographic restoration', especially when applied to paintings."[232] It uses the analogy as a tool for filling in the missing parts. They are added based on the evidence and suggestions that are inherent to the object itself. That is why the parts of the process that include the survey and data gathering/analysis are crucial. Otherwise, the restorer would have the full freedom to invent any shape resulting in, however paradoxical this may sound, a digital forgery of the historical authenticity. The connection with the material cultural object and its museality must never be severed. That is why authenticity is one of the main issues in virtual restoration and the reason for creating the London Charter and Principles of Seville.

What happens when the missing parts are too large and the object and various sources provide no evidence about the original appearance? One option is to "borrow" the logic of current restoration practice and, in the case of paintings, use "schematic reconstruction, neutral retouching, and chromatic dampening…to visually harmonize" the remaining parts.[233] However, this is not always the case, and practice shows it. There are examples where whole structures were recreated even though it is unknown what they truly looked like in the past. Even though comparative stylistic analysis based on surviving examples has been done, there is still no guarantee that the cultural object looked like that. This is especially problematic in the case of architecture, and yet, it is in this field that the "stylistic restoration" in the digital domain found its biggest applicability. By adding missing parts, even when using comparative analysis, one still enters the domain of the subjective. Many historians and archaeologists are concerned by the subjectivity of their interpretation of a site or an object.[234] In the case of the above-mentioned VR version of the Forum of Augustus, which is regarded as highly successful use of virtual reality in cultural heritage and education, the violation of the just-presented restoration logic is evident. Where does the justification for such reconstruction lay then? It lays in the context. The context is what justifies the interventions, both physical and digital.

To understand the different contexts, two very similar yet different terms need to be introduced: **virtual restoration** and **virtual reconstruction**. The first one "aims at digital

---

[232] E. Pietroni and and D. Ferdani, op. cit. p. 4
[233] Ibidem, p. 4
[234] A. Watterson, op. cit. p. 122

preservation of the information about this [cultural] content, enhancing its legibility," while the second one "aims at 'valorization' and dissemination of the object, enhancing its meaning and function."[235] It can be stated that the virtual restoration thus serves as improving the documentary aspect of the object, i.e. informational function. On the other hand, virtual reconstruction emphasizes the communicational function by putting the object in a wider context, such as VR for example. It needs to satisfy three conditions: legibility, contextualization, and narration. While the first one falls under restoration, the other two belong to the reconstructions. The first one implies the clear identification of the object. The second is its relation to the primary context for which it was created or in which it was used. The third in a certain way goes beyond the reconstruction. It uses it as a visual background,[236] but the narrative itself belongs to the communication of knowledge, or in other words, education. Therefore, which of the two approaches will be used depends on what needs to be achieved? The goal dictates the context and the context dictates the tools.

The main difference regarding the goal is to identify who is the audience? For whom is the model being made? This determines the visual result and the overall approach. The problem that occurs with technological advancement is that the better the models look, the easier it is to believe them. This especially applies to VR as it decreases the aesthetic distance. As was mentioned earlier, increasing the level of symbiosis between the observer and the illusion decreases this distance proportionately. As a result, a feeling of real presence within the virtual is achieved, but the critical understanding of the artwork is diminished. This mechanism becomes highly problematic with a nonprofessional audience that is more likely to absorb the presented without a critical approach. "Certainly, a compelling visualization can make itself 'easy to love and difficult to doubt'."[237] "Given the idiom 'seeing is believing,' the realism achieved by modern visualization systems could lead the users to perceive the virtual model as 'truth' instead of as the result of interpretation."[238]

The basic difference between the visualization of a model made for an expert audience and a wider one is that the former is more analytical, while the latter is usually more narrative, visually

[235] E. Pietroni and and D. Ferdani, op. cit. p. 6
[236] Ibidem, p. 6
[237] A. Watterson, op. cit. p. 122
[238] E. Pietroni and and D. Ferdani, op. cit. p. 7

stimulating, and dynamic. Communication tools can be active and demand more participation from the spectator, such as VR or augmented reality, or passive, as is the case with a movie, a material 3D model, or a picture. Both approaches can be used for both types of audience, even though it would be advisable to have a more interactive one for the non-expert visitors.

Regarding VR aimed at professionals with an in-depth knowledge of the topic presented, it should have a visualization of various levels of information. By this, I mean a connection to the database on which the model was based, "records about construction materials or executive techniques…additional textures…or to make the inner stratigraphies visible and comparable."[239] Using this information, experts can, for example, test a hypothesis or gain ideas about possible further problems or model developments.

As for the non-expert audience, the goal is to educate them by explaining the primary context of the cultural object, its origins, use, what it looked like, etc. These models are usually virtual reconstructions because they need to narrate. As a result, their creation often employs the "stylistic restoration" where lots of details have to be invented even though no precise documentation exists. As it was mentioned earlier, there is an aspect of fantasy in these models. "That does not mean that a 'fantasy' element is a bad or negative quality. It can be much more of a dynamic catalyst that sparks audience engagement with the digital heritage representation."[240] The narrative justifies the hypothetical reconstruction as it usually needs to take into account a much wider range of objects and information that surpass the cultural object itself. Hence, artistic freedom is more justified in this case. This is further promoted by the rise of post-processualism.[241] It has promoted the discussion of using artistic methods in research, hypothesis testing, and presentation of knowledge. It prompted "supporting self-reflexive phenomenological approaches and the creation of narratives as an academically viable means of experiencing and understanding sites and landscapes,"[242] as well as artistic and cultural objects

---

[239] Ibidem, p. 12
[240] H. Thwaites, op. cit. p. 336
[241] Postprocessualism is a collective term for a number of approaches to the past, all of which have roots in the postmodernist current of thought that developed in the 1980s and 1990s: neo-Marxist, post-positivist, phenomenological, praxis, and hermeneutic. (C. Renfrew and P. Bahn. *Archaeology,* London, 2016. p. 44)
[242] A. Watterson, op. cit. p. 122

In order to create, for example, the reconstruction of the Temple of Mars Ultor, the team that was in charge of making the model had to rely on archaeological data from the site, but also historical documents, art history, literary sources, etc. "The reconstructive model has been designed starting from the three-dimensional survey of the archaeological site and from some architectural fragments that have been relocated with a process of virtual anastylosis. The missing parts have been completed by referring to the numerous iconographic testimonies, historical-archaeological documents, and stylistic comparisons."[243] All of this was needed for a more accurate reconstruction. However, missing data still needs to be implemented hypothetically, relying on subjective decisions. For example, the color of the details, or how the sculptures on the forum in front of the temple looked like. These are minor, but still, key elements, that allow for the impression of the past time to be reinvented, and through VR relived. "In a brief time, the viewer can cross centuries."[244]
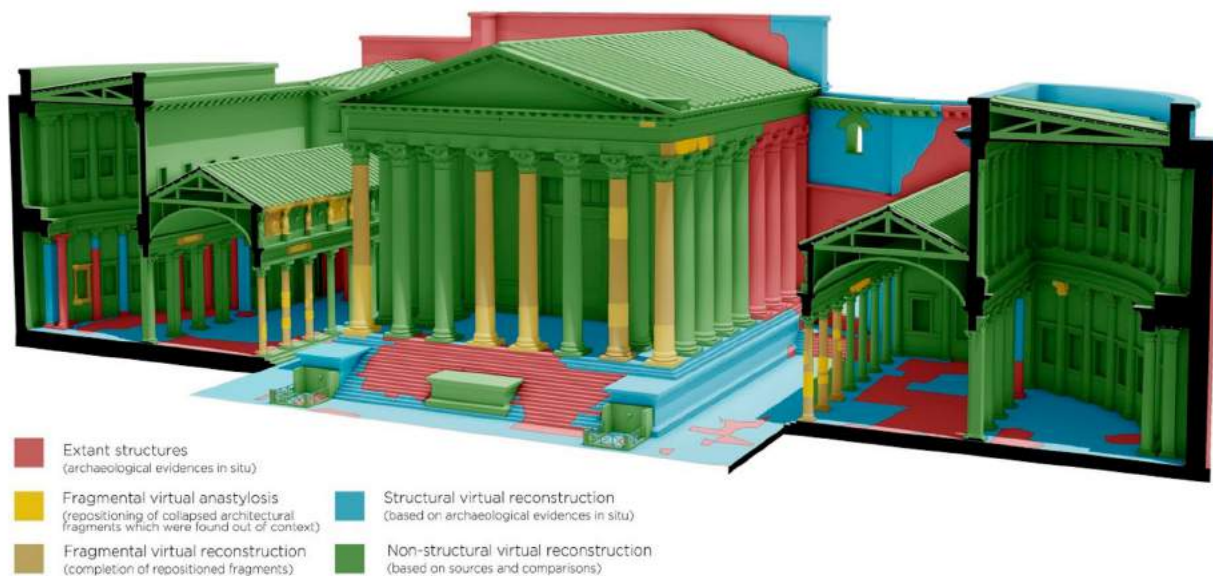
19 Virtual reconstruction of the forum rendered in coded colors, mapping the levels of reliability. (Virtual restoration, p. 24)

The fact that certain parts need to be improvised implies the potential of creating a deception of the observer, making him/her believe in something that never occurred. "It is very difficult, even for experts, to distinguish what is original and what is a hypothesis. Moreover, it is impossible to know what kind of sources and logical processes are used to formulate a

---

[243] E. Pietroni and and D. Ferdani, op. cit. p. 23
[244] H. Thwaites, op. cit. p. 337

reconstructive hypothesis."[245] Because of this, certain scholars have argued that more importance should be given to "interpretive substance" over "technology and aesthetics."[246] This raises an ethical question that stems from the liberty of possibilities allowed by technology.

The first part of the ethical issue is related to the main consequence of archaeological practice, i.e. taking the object out of its primary context. This process is nowadays heavily documented and the data obtained play an important role in understanding the cultural object. However, loss of information and irreversibility of the excavation process is inevitable. The object is then digitized and this causes another problem. "The fundamental data for analysis has been transformed from physical to digitally virtual, with an unknown amount of change or loss. This provides little to no chance of replicability in data collection due to archaeological excavation's inherently destructive nature."[247] Hence, the process of digitalization mimics the process of excavation. In both cases, the loss of data remains permanently unknown.

The second part of the ethical issue lies in the usage of tools for the construction of virtual models. The problem is not in the tools themselves, or the methodology, but the resulting model, and how far it has gone compared to its material counterpart (taking into account also the purpose of the model). "Just because something can be accomplished faster, or easier, with a digital approach does not mean that the ethics of that approach are equal."[248] I would also add that, just because something can be presented in a visually rich way, does not mean that it conveys knowledge and fulfills its educational purpose in a better way.[249]

The example can be found in the virtual reconstruction of Nero's Domus Aurea. Nowadays, nothing much remains from one of the most sumptuously decorated and architecturally most elaborate complexes of ancient times. If a virtual reconstruction is to be made and then presented to the audience before the encounter of the actual remains, it could cause dissatisfaction in the viewers. Another thing that can be pondered upon as a consequence of the wider accessibility of such models is the reduction "of the ability to 'read' and understand the fragmentation of cultural

---

[245] E. Pietroni and and D. Ferdani, op. cit. p. 6

[246] A. Watterson, op. cit. p. 127

[247] L.M. Dennis, "Digital Archaeological Ethics: Successes and Failures in Disciplinary Attention," in: Journal of Computer Applications in Archaeology, 3(1), p. 213 https://doi.org/10.5334/jcaa.24

[248] Ibidem, p. 213

[249] M. Economou and L. Pujol Tost, "Educational Tool or Expensive Toy? Evaluating VR Evaluation and its Relevance for Virtual Heritage," in: *New Heritage: New Media and Cultural Heritage*, ed. Y.E. Kalay, T. Kvan and J. Affleck, New York, 2008. p. 254

heritage."[250] Hence, the threat is tripartite: firstly, because the model drifts too far from the material original; secondly, because the audience cannot understand the relation of the remaining fragment to the model; and thirdly, because in order to make a model of something that has survived in traces compared to its former appearance, one needs to heavily rely on speculative interpretation and subjective visualization. Therefore, I would argue for detailed models to remain in the domain of the archaeological site or within a museum, where the material reference is exposed to the public, rather than on the internet. This allows for a visual comparison to be done on spot and enhances the educational aspect of the 3D or 2D models. The ones that do end up online and become widely accessible need to be justified. Experts "cannot simply state than an image [or a model] is speculative interpretation, they must also demonstrate to an audience why this is the case."[251] However, the fact that a digital replica is put on the official website of a museum gives it a certain degree of authority through institutional support. The public will accept this as true and would acknowledge the connection between the digital copy and the original.[252]

This above-mentioned problem is, of course, more important in the case of ancient sites where every virtual reconstruction risks becoming too detached from its material reference. On the other hand, in cases where the original is preserved in a perfect state, the online digital model offers a different kind of experience to the viewer, enriching his/her impression and knowledge. A

20 A screenshot of VR of Stanza della Segnatura for desktop experience

---

[250] E. Pietroni and and D. Ferdani, op. cit. p. 25
[251] A. Watterson, op. cit. p. 123
[252] F. Cameron, op. cit. p. 56

fine example is the VR version of Raphael's *Stanza della Segnatura* in the Apostolic Palace of the Vatican museums.[253] Here I would like to demonstrate the differences (and similarities) between the real-time observer in a museum and one accessing a VR version from home. The inability of VR to reproduce all aspects of the original leads to a problem of inconsistency between the real and the virtual experience. This is obvious since the virtual version on the website of the Vatican museums shows the Stanza in "an idealized" museum setting. As described earlier, the situation within the digital version is predetermined. It is also constant and unchanging and as such not a faithful reproduction. The person watching it from home (whether through a computer or a headset) will have a hard time enjoying it the same way in real life due to it being overcrowded with tourists.

A deeper divergence between the virtual and the real experience lies in the dispersion of the artistic aura. The "original" setting has its own atmosphere and provokes certain emotions in the viewer thanks to its aura. The viewer is also allowed to move through the room creating a more personal interaction with each of the paintings. On the other hand, the reproduced digital version disperses the aura with its "idealism" and predetermined situation. The interface between the real and the virtual is the key point for an optimal VR experience. Through it, the "character and dimension of interaction is determined as well as the degree of observer psychological involvement with the work of art."[254] In the VR version of the Stanza, unlike in real life, the observer is given a spot from which all the frescoes can be seen. He can zoom in on each of them, which of course is impossible in real life, but the quality of the zoom, at this point, is far from optimal. At magnification, the frescoes become somewhat blurry. Therefore, one can say that through mass reproduction the focus on the artistic quality of the original artwork shifts to a focus on its exposure (its ability to be publicly exhibited and accessible).[255] This applies, to a greater or lesser degree to any case of VR application to cultural heritage (so far). With the advancement of technology, these "problems" will decrease and eventually be solved, allowing for a perfect copy to be made.

---

[253] This is the official link of the VR version of Raphael's Stanze in the Vatican Museums: https://www.museivaticani.va/content/museivaticani/en/collezioni/musei/stanze-di-raffaello/tour-virtuale.html
[254] O. Grau, op. cit. p. 344
[255] V. Benjamin, op. cit. p. 108

Summary of Virtual Restoration and Reconstruction

To summarize, virtual restoration and virtual reconstruction are two different concepts that are applied to digital cultural objects. The first one aims at preserving and emphasizing the documentational function of the object, while the second one serves to communicate knowledge to the audience with the goal of education. "The reproductions are the means by which cultural capital is spread, and the rules and habits of looking are developed."[256] The audience can be either an expert or a non-expert one, and depending on this, different methodologies and the tools will be used. In the case of the former, the model should be more analytical, while in the case of the latter, the importance shifts to the narrative and participation. The process of making a virtual model needs to be clearly documented and divided into different stages that allow transparency following the principle of recognition of intervention. The advantage that virtual restoration and reconstruction have over Brandi's practical principles is that the "stylistic restoration" or restoration based on analogy is allowed in the digital domain. However, the downside is the loss of referential connection with the original material object. If this occurs, the model becomes self-referential and, as such, no longer serves in preserving and presenting the "digital patrimony." The risk of over-working the model, or inventing the missing parts raises ethical questions of data loss, the decrease in the ability to understand the fragmented material, and the issue of authenticity.

The last part is the comparison between the live observer and the one viewing the object through a VR headset. The former is in contact with the "artistic aura" that encompasses historic layers in itself. However, he/she needs to adapt to the current circumstances in the museum. The latter, on the other hand, is in a predetermined context that allows him/her to enjoy the digital copy but is deprived of the auratic aspect of the original. The focus is on the experience rather than on the contemplation of the object.

Thus, the main conclusion regarding the relationship between the virtual restoration/reconstruction and the practical one is that they "should no longer be perceived as opposed, but as a 'continuum,' bringing values to cultural and human experience."[257]

---

[256] F. Cameron, op. cit. p. 55
[257] E. Pietroni and and D. Ferdani, op. cit. p. 27

Medieval Art: Heritage, Theory, and Aesthetics

The basilica of Santa Maria Assunta has immense importance both as a historical monument and as a religious one. It embodies the concept of "religious memory" that stands as a testament to human beliefs and faith, both of the past and the present.[258] As was mentioned earlier, such a building belongs to the museum type called the "church in the cult."[259] The main feature of such an object is to present its inventory that often consists of invaluable works of art tied to specific beliefs and rituals. They are often repositories of artifacts accumulated over time that present the historical narrative of the building, but also the taste and style of the periods in which they were produced, and spiritual doctrines that are embedded in them. The Torcello basilica is a perfect example with its many renovations, additional structures, interior refurbishments, and intense restoration history. Therefore, I would like to present the main artistic and religious ideas that shaped the current architecture and the mosaics/frescoes that adorn its inner space. The concepts presented in this chapter will be used as arguments for restoration proposals, both practical and virtual, following the multidisciplinary approach that is much appreciated in today's practice of conservation and restoration of cultural heritage.

The Istanbul Declaration from 2002 states the following:

> "[A] set of living and constantly recreated practices, knowledge, and representations enabling individuals and communities, at all levels, to express their world conception through systems of values and ethical standards. Intangible cultural heritage creates among [religious] communities a sense of belonging and continuity, and is therefore considered as one of the mainsprings of creativity and cultural creation. From this point of view, an all-encompassing approach to [religious] cultural heritage should prevail, taking into account the dynamic link between the tangible and intangible heritage and their close interaction."[260]

Following this, in 2003, UNESCO organized a Convention on the Safeguarding of the Intangible Cultural Heritage that treated religious "practices, representations, expressions, knowledge, skills— as well as the instruments, objects, artifacts and cultural spaces associated therewith"[261] as part of religious heritage and should not be separated from its material counterpart. In the case

---

[258] T. Tsivolas, *Law and Religious Cultural Heritage,* London, 2014. p. 41
[259] I. Maroević, op. cit. p. 256
[260] T. Tsivolas, op. cit. pp. 48-49
[261] Ibidem, p. 79

of religious art, the material objects are the bearers of intangible concepts that they represent. As such, bearing in mind the abovementioned declaration and convention, the two – material and immaterial – in the case of religious cultural heritage cannot be separated. A deeper explanation of this concept lies in the very nature of medieval art. Hence, I will try to reconstruct and explain the tight, inseparable bond that exists between the material and immaterial aspects of medieval art, starting with the architecture and functionality.

Architecture and Functionality of Objects

The very act of constructing a church mimics the act of God constructing the world. God is considered a primordial architect who builds without using and shaping material, and designs this world and its hierarchy.[262] As a consequence, building a church implies an act of imitation that results in a particular space dominated by the sacred. This concept stems from the idea that a

21 The mosaic of St Augustine in Torcello

---

[262] K.E. Gilbert and H. Kun, *Istorija Estetike,* trans. D. Puhalo, Belgrade, 1969. p. 118

church with all of its architectural elements (towers, pilasters, arcades, blind arches, etc.) and its decorations (portal sculpture, consols, pillars, columns, mosaics, pavements, frescoes, etc.) is a reference to the City of God or Heavenly Jerusalem. The identification is derived from St Augustine's *De Civitate Dei*.[263] The appearance of a Romanesque basilica in a certain way resembles that of a fortress.[264] To make the connection more obvious, churches are meant to be tall and point towards the sky in order to unite the otherworldly and man-made structures.[265]

As a divine structure on Earth, the sacred must be clearly separated from the profane. According to Dionysius the Areopagite, whose work was among the most influential in the medieval period, the divine needs to be protected from the profane touch and its contaminating effect.[266] Therefore, special attention in texts and scriptures of religious fathers was devoted to the interior. According to a 6th-century historian Procopius of Caesarea, a religious building is, first and foremost built to be beautiful.[267] Beauty, in the notion of early medieval times, but also in the

22 Building the Tower of Babel, Morgan Bible, c. 1240, Pierpont Morgan Library, New York

---

[263] R. Toman, op. cit. pp. 13-14
[264] Р. Асунто, op. cit. p. 89
[265] R. Đokić, *Istorija estetike III*, p. 269
[266] Р. Асунто, op. cit. pp. 88-89
[267] R. Đokić, *Istorija estetike III*, p. 268

later period, could be defined in two important aspects. The first one, and the one which I will devote more time to analyze and explain, is its participation in the Divine and the Being. The second one is the principle of harmony manifested through numbers which govern the mathematical principle.[268] Saint Basil of Caesarea, one of the 4th-century Cappadocian fathers, stated that God realized that his creation i.e. the world, is beautiful. "This does not mean that His creation was pleasing for His eye…but that beautiful is what is built in accordance with the principles of art and serves its purpose well."[269] The fact that something has a purpose to serve directly implies that it has a utilitarian character. The notion of utility and functionality is crucial for understanding and defining medieval art.

The best unity between the concept of beauty and functionality is realized in the interior decoration of the church. A somewhat lengthy description of interior decoration and its purpose is given by Gregory of Nyssa in his text *De Sancto Theodoro*. I am quoting it here at almost full length for the reason of understanding the beauty realized through purpose, and its impact on the observers who came to venerate the relics of the saint. This excerpt encompasses all the main aspects described in the previous paragraphs and is crucial for further explanations as well as restoration ideas. The text goes:

> But somebody coming to a place like this one, where we are gathered today, where the memory of the just is kept alive and his holy remains preserved, is in the first place attracted by the magnificence of what they see. They see a house that, like a temple of God, is splendidly adorned by the size of the building and the beauty of the ornamentation. The carpenter shaped the wood until it had the form of animals and the mason polished the stones until they had the smoothness of silver. The painter colored the blooms of his art, having depicted on an image the martyr's brave deeds, his opposition, his continuous pain, the beastly appearance of the tyrants, the insults, the blazing furnace that was the athlete's most blessed end, the representation of the human form of Christ, who was the president of the games – having fashioned all these things for us by his use of colors, he portrayed, as if in a book that uttered speech, in great detail the martyr's contest and at the same time he also adorned the church as a beautiful meadow. For even though it remains silent, painting can speak on the wall and be of the greatest profit. And the mosaicist, for his part, made a floor to tread on that was worthy of the martyr's story.

---

[268] Regarding the principle of numbers and their importance for medieval art, several chapters in K.E. Gilbert and H. Kun, *Istorija Estetike* are dedicated to it: 115-119.

[269] R. Đokić, *Istorija estetike III*, p. 269

Taking delight in the seeing of such works that can be observed, one longs for the rest, in particular, to approach the tomb, trusting that touching it results in sanctification and blessing.[270]

We can imagine that a similar description could have been applied to the basilica in Torcello with its *opus sectile* floor, its marble columns and capitals, golden shimmering mosaics, and many altars with relics of saints from Altino.

The architecture is "inextricably linked to the concept of functionality"[271] and reaches its peak during the service. The purpose of the liturgy was to make the connection between the viewer and the divine. This was achieved through a particular atmosphere to which mosaic decorations, chanting[272], and incents contributed the most. Mosaic tesserae had a crucial role in reflecting light and enhancing the feeling of the presence of the divine. The role of art was an anagogical one, forcing the viewer to experience the divine through the mental endeavor.[273] "The observer would gradually identify with the light and lose the feeling of real presence. He absorbs the light and feels as if he himself is glowing."[274] Thus, medieval art had an existential role that forced the viewer (during the service or prayer) to actively participate in the artwork.[275] This was achieved by employing another crucial element that is in medieval thinking inseparable from the notion of art i.e. the light. This concept and its relation to the image or the icon will be explained in the next chapter.

It is very important to point out that the concept of art that is used nowadays as such did not exist in the Middle Ages. All the practical arts, the ones that had to use a material to produce something, were regarded as mechanical art (*artes mechanicae*). This term is closer to our notion of crafts. It was opposed to liberal arts (*artes liberales*).[276] Hence, it can be stated that medieval artworks were closer to our understanding of applied arts, rather than fine arts. However derogatory or underestimating this may seem, many religious thinkers admitted the supremacy of art, mainly

---

[270] D. Iozzia, *Aesthetic Themes in Pagan and Christian Neoplatonism: From Plotinus to Gregory of Nyssa,* London, 2015. pp. 49-50

[271] T. Tsivolas, op. cit. p. 72

[272] For the part of chanting, I would recommend an interesting paper that deals with the archaeoacustics in medieval churches: 'Digitization of Acoustic Heritage in a Service of Protection, Research and Promotion of European Cultural Heritage' by Z. Đorđević and M. Dragišić, in: *Digital Cultural Heritage,* ed. H. Kremers, Cham, 2020. pp. 433-447

[273] P. Асунто, op. cit. p. 31

[274] R. Đokić, *Istorija estetike III*, p. 273

[275] P. Асунто, op. cit. p. 31

[276] Ibidem, p. 14

of painting, over philosophy especially when applied to a general level of understanding. By this, I mean to laity and its understanding of intangible/spiritual messages embedded in images. Gregory the Great, one of the four doctors of the Catholic Church, presented the concept of *ut scriptura pictura* the equates writing and painting. According to him, both have the same goal of education but are addressed to two different groups. Writing is for the literate, while painting is for the illiterate.[277] However, Basil the Great (Basil of Caesarea) and Gregory of Nyssa think that images are not just for the illiterate since they allow "the onlookers" to "gain an understanding that is immediate and universal."[278] Hence, the silent language of images achieves supremacy over philosophy through the direct transmission of religious messages. A product of *artes mechanicaes* is, therefore, better in spreading the knowledge of the divine than the dialectics of *artes liberales*.[279] According to John of Damascus, an image is "revelation and manifestation of the hidden."[280] Therefore, the purpose of art was not as today's one, to be enjoyed (to over-simplify today's understanding), rather it had a virtually practical aspect – serves a purpose, conveys meaning, and provokes a certain effect.[281]

Understanding Medieval Images: History of Aesthetics

With the last paragraph of the previous chapter I have explained the medieval notion of an artistic object, and through it introduced the discussion about the images and their utilitarian/applied purpose. As was mentioned before, certain crucial concepts will be presented and examined here in more detail. However, I will restrain from too in-depth analysis as it drifts away from the topic of my thesis.

Since the basilica in Torcello is a complex structure with a multilayered internal decoration that belongs to different periods and styles, I will have to cover both Western and Eastern art. Luckily, when it comes to occidental art in the Middle Ages, it draws concepts from early Christian thinkers, thus simplifying the chronological overview. According to R. Assunto, the dominant

---

[277] D. Iozzia, op. cit. pp. 45-46
[278] Ibidem, p. 48
[279] Р. Асунто, op. cit. p. 45-46
[280] R. Đokić, *Istorija estetike III*, p. 317
[281] Р. Асунто, op. cit. p. 20-21

philosophical (aesthetical) currents in Carolingian, Ottonian, and Romanesque art are inspired by the writings of Dionysius the Areopagite, and his translator in the 9th century, John Scotus Erigena.[282] Their influence will last until the 14th century in Italy.[283] The authority of Dionysius is evident also in the writings of Anselm of Canterbury who understands an image as more or less true, depending on how it reflects the things of which it is an image.[284] Because of Dionysius's undeniable impact, I would like to present an overview of medieval aesthetics and its origins. Since he belongs more to the oriental philosophical discourse, it is in the Eastern Roman Empire where I would like to begin.

The Eastern Roman Empire, or rather the Byzantine Empire presents the cultural continuation of the ancient world. The same can be said for its aesthetics. However, it would be oversimplified to say that the Byzantine aesthetics is just an extension of the ancient one. Since the culture of the Byzantine Empire was built on "Roman statehood, Christian religion, Greek culture, and much-influenced tradition by the oriental cultures, mainly the Persian,"[285] it would be folly to say that its aesthetics is just a further elaboration of Greek and Roman philosophy. There are many original elements that Christianity brought, as well as those that were directly taken from ancient Greek and Hellenistic thinkers. It should also be said that at that time there is no real notion of aesthetics as such; it is not a separate discipline, and it can be discussed only within wider philosophical frameworks.[286] However, in this thesis, I will present a distilled understanding of it, without going into the elaboration of often very complex systems of thought. Now that an introduction with basic clarifications is written, I can proceed to give a historical reconstruction.

Dionysius the Areopagite is one of the most important Christian Neoplatonic thinkers, still, the basic structure of his ideas is derived from pagan Neoplatonists from the late Roman Empire. The founder of the Neoplatonic school of thought was Plotinus in the 3rd century AD. According to him, there is a connection between physical and divine beauty that is realized in participation in the *eidos*.[287] Iamblichus, a 4th-century follower of Plotinus, defines eidos as a product of the second

---

[282] Ibidem, p. 83
[283] Ibidem, p. 84
[284] R. Đokić, *Istorija estetike III*, p. 407
[285] Ibidem, p. 261
[286] D. Iozzia, op. cit. p. 12
[287] Ibidem, p. 35

hypostasis i.e. the Mind.[288] It can be explained as a "meaningful structure" of something that "is essential, something visible within the subject; but also visible as something sensual and thoughtful."[289] I have introduced this concept because it allowed Iamblichus to develop a theory of the relationship between the whole and the particular. In relation to the One, everything else is its derivative and tends to imitate it – mimic it. The One is treated as a paradigm, while the derived is an image, or in his terminology: *eicon*. Cosmos is, therefore, an *eicon*/icon/image of the *edios*, the living-in-itself.[290] It can be concluded that every image is an image of something ontologically higher. When this is applied to art, the *techne*, it can be said that art is "*mimesis* of *physis*" as the "heart of Greek perception of the artistic problem in general."[291]

In Christianity, however, under the influence of pagan Neoplatonism, the idea of physis is understood as physical reality, as matter. Even Plotinus realized that there is a difference between physical and immaterial, abstract beauty. This was transmitted into Christianity as well, causing a certain duality. While the material beauty of art was understood through functionality and harmony of numbers, the immaterial was seen as Good and Virtue. This is also a Plotinian concept derived from his most famous work, the Eneades. In it, he explains that the soul is more beautiful when it is closer to God (One). Beauty is equal to Good.[292] He advises that one should avoid chasing the material for it is only an image, a reference to something beyond.[293] Here lies the root of the concept of an image as a materialization of something ontologically higher. It allowed the Christian

---

[288] According to Plotinus there are three hypostases: the One, the Nous and the Soul. In addition to them there is matter, which is passive and as such is not being. The One (or God) is the most difficult to explain simply, for it is between existence and nonexistence, between action and non-action. It cannot be described, for every description of it implies the confinement of its perfection. It is positioned beyond this world and as such cannot be grasped by thinking; it can only be experienced by us. But to experience it one needs to attain a high level of knowledge, which culminates in ecstasy.The Nous or the Cosmic (Angelic) Mind is the first being, and is everything. It is immovable and incapable of action, only of thinking itself, through which it is aware of its existence. The Ideas reside in it. The next hypostasis is the Soul, which still belongs to the intelligible sphere. By contrast, she is capable of action, but is dependent on the Mind, for she is born out of it. Matter is the lowest in the sequence of the world's hierarchy; it is passive and has its being in non-being. Only when Form, which is capable of action is given to it, a singular body is created. As such, matter is only an image of the upper world. (B. Bošnjak, *Filozofija od Aristotela do Renesanse i Odabrani Tekstovi Filozofa,* Zagreb, 1957. p. 60-61)
[289] R. Đokić, *Istorija estetike II*, Belgrade, 2008. pp. 319-320
[290] Ibidem, p. 321
[291] D. Iozzia, op. cit. p. 60
[292] Plotin, *Eneade*, ed. V. Marković, Belgrade, 1982. p. 35
[293] Ibidem, p. 37

thinkers to define a painting as the first step on the scale towards God. One such example is the dialectical scale of Beauty by St Augustine.[294]

Further development in the concept of an image can be found in the writings of Basil the Great in the 4th century AD. He said that if one is to look at an image of an emperor and recognizes his depiction as such, the observer does not admit the existence of two emperors. This brings into consideration the relationship between the depiction and what is being depicted, the archetype. The archetype does not affect the painting that depends solely on the idea and skill of the painter; nor does the painting make an impact on the nature of the archetype.[295]

Dionysius the Areopagite tied the image to the liturgy in the 5th-6th centuries, employing a concept similar to that of the veil. This is evident in his works titled "*Ecclesiastical Hierarchy*", "*Divine Names*", and "*Symbolic Theology*." In his notion of the icon, it is understood as a symbol that ties the material to the immaterial, following the dichotomy in medieval Christian cosmology. "Symbols that are being used during service as well as the sacrament have a purpose of, on one hand, hiding and secluding the higher philosophical truth, and on the other, to show and reveal the divine one, that must be accessible to everyone."[296] The same as veil would do; it secludes but also invites the believer to pull it aside and peak beyond. In the early 12th century, this will be formulated as a concept, that, according to Hugo of St Victor, "conceals the idea from the mystic's ratio and stimulates its activity and by its presence awakens his soul from slumber."[297] Dionysius also stressed the importance of the Eucharist during which passing from One to many is happening.[298] This is reversed in the case of art. Plotinus says that one should abstract from the plural in order to reach the singular.[299] Although he is speaking in the context of Beauty that arouses Love, the same can be applied to a painting or a mosaic. In the medieval notion of an image, a painting of an object is not a painting of that singular object, rather it is an intelligible-universal representation of that object.[300] This perfectly coincides with Dionysius's concept of the artwork as a symbol, its functionality during the service, and an implication of an ontological scale

---

[294] K.E. Gilbert and H. Kun, op. cit. p. 127
[295] R. Đokić, *Istorija estetike III*, p. 309
[296] Ibidem, p. 246
[297] K.E. Gilbert and H. Kun, op. cit. p. 134
[298] R. Đokić, *Istorija estetike III*, p. 258
[299] R. Đokić, *Istorija estetike II,* p. 287
[300] Р. Асунто, op. cit. p. 56

that culminates with God (or in Plotinus's terminology, with the One/Good). In the Romanesque period, the theory of Dionysius the Areopagite was fundamental in understanding the function of art, encompassing all the above-mentioned Plotinian and Christian aspects: the soul uses the world to project itself into the heights in which it could gaze onto the absolute Beauty. Art helps the man to get back to the One who is also Good and is Beauty in itself.[301] This is achieved through contemplation of the meaning that was embedded in the image. A material object is just the vessel for the transcendental. However, being a material metaphor for the transcendental, the object itself is transcendental as well. This is derived from the fact that its content cannot be understood through discursive thinking, only through contemplation.[302]

23 A mosaic of St Gregory the Great in Torcello

The accessibility of the Christian truths to the laity has already been explained in the previous chapter, following the concepts of Basil of Caesarea, and his brother Gregory of Nyssa in the 4th century, as well as Gregory the Great in the 6th-7th century. They have all stressed the similarity between painting and writing, as well as art's ability to "silently speak" to the believer, communicating the universal message.[303] John of Damascus in the 9th century, at the beginning of

---

[301] Ibidem, pp. 89-90
[302] Ibidem, p. 43
[303] D. Iozzia, op. cit. pp. 45-48

the iconoclastic period, defined the icon as a "similarity that reflects the archetype, but differs from the original; for it is not queal in all aspects to the prototype."[304] Hence, an icon is a tool to materially represent immaterial truths, to give "shape to the shapeless." The immaterial is ontologically higher as it is closer to the Creator. Thus, it becomes evident that this concept is a direct derivation from Iamblichus's notion of an *eicon*. John of Damascus also repeated that the image is for the illiterate the same as writing is for the literate.[305] However, he must have had in mind Gregory of Nyssa's enhancement of the universality of a pictorial depiction which is useful not just for the illiterate.[306]

24 A 14th-century Greek Icon of St John of Damascus

The last part in the chronology that I will present is the relationship between the archetype and the image. As was mentioned earlier, the archetype affects the painting/sculpture through the skill and the idea of the artist, while the final product does not impact nor change the nature of the archetype. According to Basil the Great, "the archetype and the reflection form one image that is characteristic of both."[307] But how is an artwork made? Plotinus gave an example of a sculptor modeling a piece of stone and making it beautiful. The result has beauty not because the material

---

[304] R. Đokić, *Istorija estetike III*, p. 315
[305] Ibidem, p. 315
[306] D. Iozzia, op. cit. p. 46
[307] R. Đokić, *Istorija estetike III*, p. 309

itself is beautiful, but because the new form given by the sculptor is. This form stems from the idea of the archetype present in the sculptor's mind because his soul participates in the being. Hence, it can be stated that there is an aesthetical consciousness existing in the artist.[308] Medieval thinkers adopted this concept and therefore it is not surprising that St Augustine argued that art belongs to the hyper-mental realm of the artist's mind. The idea of art is nobler than the product itself.[309] This is a consequence of art's inability to fully represent the immaterial forms. However, art in its ontology is equal to all the natural forms found in this world. Its beauty, same as that of other natural things, depends on its ability to please and arouse pleasant feelings in the observer.[310] Thus, a work of art is not beautiful because it reflects the subjectivity of its author or his personality, rather because the *artifex* was able to model it so objectively perfect that it becomes equal to natural things made by God.[311] So, an artist has the idea of Beauty or the archetype in his mind. How he will use it to create a work of art depends on his skill. And the success of a work of art, or rather its sensual beauty, depends on its similarity with the immaterial idea it represents and its ability to please the observer. Equating the work of art with natural things is achieved through the inherent characteristic of both to be contemplated. This is derived from John Scotus Erigena whose work, which was heavily influenced by *Corpus Areopagiticum*, had a profound effect on Carolingian and Ottonian art.[312]

According to Dionysius the Areopagite:

"Beautiful will be called the thing that participates in beauty, and beauty will be called the participation of the creational cause in all the beautiful things. Hyperexistential beauty is being named beauty because it gives beauty adequately to everything, and also because it is the cause of proportion and luminosity… From that beauty, all the existing things receive their existence, each in its own way."[313]

In this passage, we can see that all the main concepts were already summed up in his theory in the 5-6th centuries. God is, in a Plotinian manner equated with Beauty that gives existence to everything. Therefore, everything that exists participates in the Being and is immanently beautiful. The same applies to a work of art that, when created, also participates in the Being and is beautiful

---

[308] R. Đokić, *Istorija estetike II*, p. 286
[309] K.E. Gilbert and H. Kun, op. cit. p. 137
[310] Р. Асунто, op. cit. p. 33
[311] Ibidem, p. 37
[312] Ibidem, p. 33
[313] R. Đokić, *Istorija estetike III*, pp. 244-245

because it resembles the archetype in the mind of the artist. This archetype stems from the Divine Mind and as such possesses beauty. The culmination of this concept can be found in Anselm of Canterbury's theory of Logos in the late 11th century. He took on an endeavor to understand the nature of the Logos or the Word which resulted in giving supremacy to mental images over words. This was combined with this gnoseological and epistemological views which are the basis of his aesthetic theory. According to him, the higher beings cannot be known and understood in themselves. What helps a man to get closer to their comprehension are images created by the human spirit. Every notion of a being is a mental image, a copy of the original. These beings are more incomprehensible the more they drift apart from our image of them. What happens when an artist creates his work of art? The painting that is created is not created to reflect the artistic need *per se*, but to, in the logic of an *aporia*, become closer to the truth it represents. "Every created being is more true in the word, in the notion of the creator, than it is in itself, if the creative need is more truthful than what is created."[314] It is evident that Anselm of Canterbury gives primary importance to the artistic need to create an image, rather than to the image itself. Why? Because for him, the image that is used to represent the higher immaterial beings is actually a reflection of the creative need. This need, which is part of the mental spirit of a man, is a mirror of the highest being. However, this "highest being" cannot be seen/understood by the spirit or the mind, it can only be represented and later contemplated upon. Through this (mental) representation/image, a man can contemplate and reach the being.[315] "Therefore, it is not a coincidence that Anselm compares this image with a painting that a painter makes in himself before creating it as a work of art, because in both examples the case is that of a particular impression and creative act."[316]

To summarize the above-presented theories and concepts. God, who is also Good, Love, the One, and Beauty, creates the world and the man. By nature, the human spirit and mind possess in themselves the images of the divine, since it cannot be understood in itself. As a consequence of the desire to know Him, man creates works of art that are beautiful because they reflect the archetype, which is beautiful in itself, and because they participate in the Being. Images are understood as dissimilar copies of the higher beings, that through their contemplatable character realized their transcendentality. An image or an icon is always an image of something ontologically

---

[314] Ibidem, p. 408
[315] Ibidem, p. 411
[316] Ibidem, p. 412
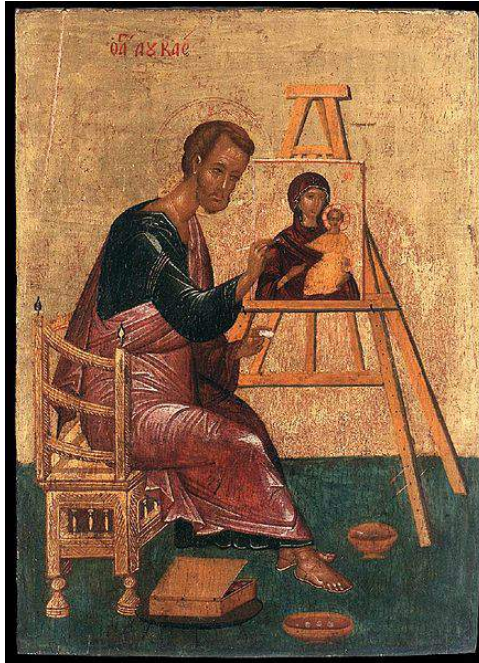
25 St Luke paints the Icon of the Mother of God Hodegetria, 14-15th century, Icon Museum Recklinghausen, Germany

higher because it does not represent a particular singular thing, rather its intelligible-universal aspect. It is immanently beautiful by the very act of participating in the Being, however, its beauty increases following the symmetry and artist's ability to make it more similar to the archetype. The purpose of an image is also a didactic one. It serves to directly present the Christian truths to the people resulting in it often being referred to as the "Bible for the illiterate."

A remark regarding the readability of art was made by Porphyrius, Plotinus's pupil and follower at the end of the 3rd century. He commented on the pagan art of mysteries, stating that it is only accessible to those who are initiated to the same mysteries. One such example can be the famous Villa of Mysteries in Pompeii. If the viewer is uninitiated, he/she is left only with the material aspect of the artwork.[317] The same comment can be made regarding Christian art and its vast symbolism. How was this complex conglomerate of meanings and symbols understood and accessed by the common crowd then? According to R. Assunto, the allegorical meaning was transmitted from generation to generation and formed part of the public good.[318] I would add, however, that the public probably was not familiar (as today) with the philosophical concepts

---

[317] D. Iozzia, op. cit. pp. 46-47
[318] Р. Асунто, op. cit. 46

behind the frescoed walls of a church. Thus, Areopagite's theory remains valid, as a work of art revealed the messages while hiding the philosophy.

The ability of a work of art to be contemplated depends on the unity of matter, meaning, ethical purpose, and otherworldliness.[319] So far, all the aspects have been explained, except matter i.e. the material used to produce a work of art. Matter possesses beauty by the very act of existing because it participates in the Being. However, each material was considered to be more or less beautiful, and it was up to the artist (*artifex*) to shape it in the most adequate way to make maximum use of its characteristics.[320]

Since the time of Plotinus, special attention was given to gold. When he wanted to stress the importance of the beauty of the soul (which is immaterial), he said that it must strive to be like gold.[321] Speaking of paintings and mosaics, gold plays the most important role. The shining and shimmering of gold was associated with the stars and the Sun in the Aristotelian tradition that Plotinus follows. It is also connected with light that "allows us to see the colors of the sensible objects."[322] Light, shine, luminosity are all understood as the glow of the inner form. *Forma est lumen purum* (Form is the pure light).[323] According to St Augustine and Erigena, who follow the Platonian and Plotinian notion, God is the Living Light.[324] Erigena even defines the universe as *maximum lumen, ex multis partibus veluti ex multis lucernis compactum, ad intelligibilium rerum multas species revelandas* (maximum light, that consists of many parts as if of many lamps, that reveals many species of the intelligible things).[325] Based on these concepts, it is quite logical that gold was understood as the material equivalent of the immaterial light.[326]

Another immensely important aspect of paintings and mosaics is color. The reason why beautiful colors are in this list is that color is related to the action of light, in the sense that it is the

---

[319] Ibidem, p. 32

[320] Ibidem, p. 27

[321] Plotin, op. cit. p. 34

[322] D. Iozzia, op. cit. pp. 59-60

[323] K.E. Gilbert and H. Kun, op. cit. p. 125

[324] Ibidem, p. 123

[325] Р. Асунто, op. cit. p. 166

[326] In the Middle Ages there was a duality in understanding the light. One was visible, that allows us to see, while the other was invisible. The latter is associated with God and the creation of the World. One such example can be found in the theory of genesis by Robert Grosseteste, bishop of Lincoln at the end of the 12th and beginning of the 13th century. (M. Quinlan-McGrath, *Influences: Art, Optics, and Astrology in the Italian Renaissance*. Chicago, 2013, p. 26)

same light that produces the vision and therefore the enjoyment of the color.[327] Its notion is similar to that of light, as these are often inseparable. Again, starting from Plotinus's philosophy, "the beauty of color is simple in its form."[328] In the Middle Ages, light-toned colors, together with the harmony of parts, were needed to please the observer. One should bear in mind that the pleasant feelings which are aroused by the work of art, are necessary to stimulate the viewer/believer to strive towards God and go beyond the material representation. For that reason, materials used in art cannot be separated from art's didactic and religious role.

Reflection on Practice

In this chapter, I will just briefly explain the main development of art in the Middle Ages, mainly in the Carolingian and Ottonian periods, as well as in Romanesque art. This I deem important, as newly-discovered frescoes in Santa Maria Assunta are dated to the 9th century, corresponding to the Carolingian period. Unfortunately, not many murals have survived into our time, thus, complicating the reconstruction of the stylistic development. They were either subject to micro-climate deterioration and decay, were painted over in later renovations of the church when a more contemporary style was appreciated, or were demolished when the church was torn down.[329] Also, one might think that the Carolingian era did not produce many monumental objects and that the rulers and bishops preferred to commission small-scale artifacts as a sort of "ornament of power."[330]

According to E. Kluckert, four main artistic movements can be distinguished in the second half of the Middle Ages. These are based, in the case of wall painting, on geography and the stylistic influence that they had on various arts:

1. The Byzantine style was dominant, logically, in the Byzantine Empire, but also in the Apennine peninsula with Rome and Ravenna as the main centers.

---

[327] D. Iozzia, op. cit. p. 59
[328] Plotin, op. cit. p. 32
[329] H. Schutz, *The Carolingians in Central Europe, Their History, Arts and Architecture: A Cultural History of Central Europe, 750-900.* Leiden, 2004. p. 333
[330] Ž. Dibi, *Umetnost i Društvo u Srednjem Veku,* trans. S. Marjanović-Dušanić, Belgrade, 2001. p. 25

2. The Hiberno-Saxon and Anglo-Saxon that was mainly present in book illumination during the Romanesque period.

3. Carolingian and Ottonian art spread across all of today's France and Germany, reaching also northern Italy. It affected book illumination that served as a transmitter of style also for the wall paintings between the 9th and the 11th century.

4. Mozarabic art between the 8th and 11th centuries was present mostly in today's northern Spain.[331]

I will focus solely on the production of wall paintings in the Byzantine style and Carolingian/Ottonian periods. "The early Christian mosaics of Ravenna and Rome were a treasure-house of form and design for Carolingian monumental painting. Just how strong this influence was, becomes impressively obvious in the little monastery church of Mustair in Graubunden."[332] Evidence of this can be found in the treatment of space and figures, as well as their relationship with the architecture that helps dictate the composition. However, this only partially agrees with Panofsky's understanding of Byzantine and Romanesque art. According to him, space, as well as figures, are all united in one "rhythmic exchange of color and gold."[333] This perfectly fits the concepts of symmetry, light, and color in medieval art as was described in the previous chapter. The unity that Panofsky was talking about stems from Neoplatonism. In it, according to Proclus,

26 Detail of the apse mosaic in Torcello showing the symmetrycal arrangement of the apostles with the bust-lenght figure of St Heliodorus in the middle

[331] E. Kluckert, op. cit. p. 406
[332] Ibidem, p. 406
[333] E. Panofsky, *Perspective as Symbolic Form*, New York, 1991. p. 49

"space is nothing other than the finest light."[334] It is quite evident in the mosaics of the main apse in Torcello, as well as the ones in the diaconicon. The figures of the apostles follow symmetry, based around the central window and the mosaic-icon of St Eliodor, with six on each side of the apse. On the other hand, frescoes from the Munster church, which are dated 2 centuries before, do not follow this pattern, even though they are in part influenced by the Italo-Byzantine style.

Regarding Carolingian art, it is known that the court of Charlemagne was envisioned as a tool to revive the ancient culture, as it was present in the Byzantine empire. However, it was a heavy task since the level of education was incredibly low. Still, his capital in Aachen became, for a brief moment, the main cultural center in the western world. It was based on the monuments he had seen in Ravenna and Rome; mainly San Vitale and the Pantheon.[335] The objects that have survived the most from his time are the illuminated manuscripts painted and adorned in the numerous *scriptoria*, and reliquaries, made to house an abundance of relics that were obtained as spoils of war. "It is interesting to note, that there is no compelling link between the painting of murals and the illumination of books. Libraries and scriptoria did not necessarily stimulate wall painting."[336] The empire of Charlemagne was quickly torn apart after his death in 814.[337] This process was sped up by barbaric invasions from the North, the South, and the East.[338] The Western Roman Empire was renewed for the second time in 962 under Otto I, marking the beginning of the so-called "Ottonian period."[339]

The main examples of monumental painting in the 9th century can be found in the church of St John in Mustair, the Benedictine church of Malles in South Tyrol (the style of the surviving frescoes in this church resemble the most the newly discovered ones in Torcello), the church of Patroklus in Naturno, and the crypt of the abbey church of St Maxim in Trier.[340] All of these churches were built following a pilgrimage road. There is only one mosaic from the time of Charlemagne that is still preserved today. It shows the Arc of the Covenant and is located in the Oratory of Theodulf in Sen Germigny-des-Pres.[341] The immense influence of the Byzantine style

---

[334] Ibidem, p. 49
[335] Ž. Dibi, op. cit. p. 23
[336] H. Schutz, op. cit. p. 334
[337] E. Kluckert, op. cit. p. 383
[338] Ž. Dibi, op. cit. pp. 26-27
[339] Ibidem, p. 29
[340] H. Schutz, op. cit. p. 334
[341] E. Kluckert, op. cit. p. 384

is obvious. This comes as no surprise, since Charlemagne was in Rome and Ravenna, and was quite well informed of the artistic remains from the Roman times.

27 Scene of the Flight to Egypt, Abbey of St John of Munstair, 9th century

The churches in the Carolingian era had their walls fully covered with murals. The one of St John in Muster is an excellent example.[342] If the basilica in Torcello was, indeed a Carolingian one, bearing in mind the newly discovered frescoes in the diaconicon, one can make a relatively strong assumption that it, too, was once fully adorned with frescoes. By this, I am referring to the 9th-century structure, that was further enlarged during the 11th century.

According to Panofsky, the period of Carolingian art started to sever the bond with antiquity. "Now a line is merely a line, that is, a graphic means of expression… Surface, meanwhile, is now merely surface, that is, no longer even a vague suggestion of an immaterial space, but rather the unconditionally two-dimensional surface of a material picture support."[343]

---

[342] H. Schutz, op. cit. p. 335
[343] E. Panofsky, op. cit. pp. 50-51

This was continued in the Ottonian period, and reached its peak in the Romanesque art of the high Middle Ages. I must admit that I do not fully agree with Panofsky's description here. It can be stated that the art of the Carolingian, Ottonian, and Romanesque periods is more 2D when compared to the Byzantine, but the idea of immaterial space is still present. This is evident in the views of medieval scholars whose theories and understandings were presented in the previous chapter.

What absolutely dominates the murals in the second half of the Middle Ages are the group scenes. There are two main approaches to how these can be conceived and realized: the additive and the integrative principle. The former means that the group scene will have figures just standing next to each other. The latter, however, tends to create a certain spatial feeling that often results in the "pilling-up of bodies."[344] Which of these will be used depends on the topic of the painting. On the same wall showing different scenes, both approaches can be seen. In the case of the 11th-century church of Sant'Angelo in Formis, near Naples, the "Last Supper" is more additive, while the "Betrayal of Christ" is integrative. A special case of the additive approach is the so-called *isocephaly* that is highly characteristic of Byzantine art.[345] Once again, the main apse in Torcello is a perfect example. This opens up a new topic, that of the apse decoration. It is usually dominated by the figure of Christ in a *mandorla* surrounded by evangelists, saints, angels, bishops, or apostles. A good example is the apse of the above-mentioned church of St John in Mustair:

> "Carolingian painting in the central apse, immediately above the window, shows the Pantokrator, Christ in Majesty seated in a double mandorla, decorated with a lozenge motif, the head surrounded by a cross and nimbus. Outside the mandorla are located the tetramorphs, the evangelical symbols, of which, however, only the winged male figure representing St. Matthew is clearly identifiable. The three others are too pale and too corrupted to name. The Heavenly Host surrounds the mandorla."[346]

We can only suppose that something similar was painted in Santa Maria Assunta. However, due to the presence of the mosaic and the marble slabs, it is impossible to know for sure. Personally, bearing in mind the dedication of the church, it would be quite plausible if the main apse was adorned with a scene of the Virgin Mary. She could have been depicted enthroned as is the case of the 11th-century church of St Chef. Positioned like that in the main apse, she would establish "a

---

[344] H. Schutz, op. cit. p. 416
[345] Ibidem, p. 416
[346] Ibidem, p. 336

visual connection with the altar below her, placing her firmly in the liturgical context."[347] This is immensely important because, during the liturgy, the One goes onto the many, i.e. the singular Divine reaches the faithful.[348] Regarding the believers who would view this during a service, they would feel surrounded by these figures that "can be experienced as a real group."[349] Hence, it is quite logical that Panofsky concluded that during the Middle Ages, an image together with what is depicted, constitutes *ousia*, i.e. objective reality that comes into the consciousness of the believer.[350]

To conclude, I will quote a sentence from an Ottonian codex that speaks of an image of the Virgin Enthroned and summarizes all of the earlier-presented concepts: *Hoc visibile imaginatum figurat illud invisibile verum cuius splendor penetrat mundum* (This visible image represents that invisible truth that of which splendor permeates the world.)[351]

28 Mosaic in the main apse of Santa Maria Assunta showing the Virgin Mary holding infant Jesus (photo taken by the author)

---

[347] E. Kluckert, op. cit. p. 434
[348] R. Đokić, *Istorija estetike III*, p. 258
[349] E. Kluckert, op. cit. p. 419
[350] E. Panofsky, op. cit. p. 72
[351] Р. Асунто, op. cit. p. 87

Restoration Proposals

This chapter deals with the practical approach as suggestions to be applied in the case of the three conservation issues in the basilica of Santa Maria Assunta in Torcello. It is based on the contemporary postulates in conservation, museological theory, and the knowledge of the virtual. Since 1992, the overlap of the sphere of museology and the caring for cultural heritage.[352]

The three conservation-presentation issues in the basilica are the apse, the crypt, and the diaconicon. In the case of the first one, the two-layered wall decoration in the main apse is followed by the issue of the bishop's throne. Here, virtualization, as a complementary tool to practical restoration, is used to help support the narrative. The second one is the crypt with its pergola and the lack of vault decoration. In this case, virtual is used as an addition to the reality that enhances the readability of an object. The last one is the problem of the inaccessibility of the newly-discovered frescoes above the mosaic decoration in the diaconicon. In this case, the focus is on the copy as a didactic tool and substitute for the original. All the proposals are based and argued on the postulates and concepts previously exhibited in this thesis using the multidisciplinary and transdisciplinary approach.

Before addressing the main issues, it is important to stress that Santa Maria Assunta is the church in the cult[353], that exhibits its objects and works of art in a museum-like context with the aim of preserving its sanctity. Therefore, all of the interventions made need to take into account the importance of the objects themselves, their place within the church, the importance of the church for the island and its local community, and finally, the role of the island of Torcello in the lagoon of Venice. The logic of this approach is based on the micro-macro principle. This follows the value-based approach in which "conservation professionals" are "supervising the stakeholder groups."[354] Hence, the conservation team and the stakeholders need to be identified. The most typical stakeholders are government agencies, archaeologists and other professionals, local

---

[352] I. Maroević, op. cit. p. 102

[353] Ibidem, p. 256

[354] I. Poulios "Discussing strategy in heritage conservation: Living heritage approach as an example of strategic innovation," in: *Journal of Cultural Heritage Management and Sustainable Development*, Vol. 4 No. 1, 2014. p. 6

communities, tourists and touristic agencies, and religious tourists/pilgrims.[355] I will not be going further into this as it belongs to the management of the site. However, it should be noted that a lot of museums are paying more and more attention to the experience of the visitors, giving space for their opinion.[356] "In the case of entire 'sites', i.e. complex works of man and nature than combine both tangible and intangible assets, insofar as these areas are still associated with a 'living' religious tradition and, thus, are still functioning as 'sacral' places, their legal approach, and therefore their management, involves delicate issues of cultural, spiritual and natural maintenance. Hence, when approaching such sites, one must keep a balance between heritage preservation, cultural management, tourism development, and 'active' practices of faith."[357]

Another very important point related to the church as a museum space is the preservation of sacral character. B. Deloche, when quoting Malraux says that any museum has the function of preserving the sacred.[358] In the case of Torcello, and its potential virtual tools, it plays the main role of narrating the "time, people, context of life, and knowledge."[359] The beginning of this kind of preservation begins with the conservation of the material, especially of that which by Brandi is termed "aspect," as it is the bearer of the artistic meaning.[360] This is achieved when the tangible is viewed in the wider context, the intangible one.[361]

As for the virtual counterpart, it was already stressed that through the use of reproductions, the "cultural capital is spread."[362] It should be noted that the use of technology, however appealing it may be, should not lead to fetishizing it.[363] On the other hand, the cybernetic approach and the digital heritage have become an almost inseparable part of the museum and exhibition practice. Digitalization and virtualization allow for new ways of presenting and understanding the past. This is made possible because virtualization transports the given problem into other possible solutions.[364] These solutions are visualizations in the form of a movie, VR, augmented reality (AR)

[355] M. Demas, "Planning for Conservation Management of Archaeological Sites: A Values-Based Approach," in: *Management Planning for Archaeological Sites, Los Angeles, 19-22nd May, 2000*, ed. J.M. Teutonico and G. Palumbo, Los Angeles, 2000. p. 6

[356] B. Deloš, op. cit. p. 81

[357] T. Tsivolas, op. cit. p. 74

[358] B. Deloš, op. cit. p. 220

[359] I. Maroevic, op. cit. p. 13

[360] Ч. Бранди, op. cit. p. 41

[361] T. Tsivolas, op. cit. p. 49

[362] F. Cameron, op. cit. p. 55

[363] A. Watterson, op. cit. p. 120

[364] B. Deloš, op. cit. p. 136

or mixed reality (MR), 3D models, or 2D reproductions. Whichever of these is chosen as an adequate tool for the solution to the problem, two important questions must be answered: 1. "Is the use of this tool in a digital form adding value to the project that is balanced by the ethics of its use?"[365] 2. For whom is the model made i.e. who is the group that the model is meant for?[366] Only when both of these questions are provided with satisfactory answers, one can proceed to make digital models. Therefore, in my proposals, the practical side will be examined first, as the virtual restoration needs to form a continuum with it, depending on its results. After this, the pros and cons of each of the digital solutions to the problems will be presented, provided that the answers to the two questions presented above are clearly defined.

Two-layered Wall Decoration of the Main Apse

Certainly, the most important part of the interior decoration, together with the mosaic of the Last Judgement, is the main apse. Even if the architectural structure dates to the 9th century, the interior decoration is from the 11th century during the Orseolean rule.[367] This applies both to the frescoes and the mosaic with the marble slabs. Even though the frescoes in the apse were initially dated to the 7th century during the reign of bishop Deusdedit I, more recent research has put them firmly in the mandate of Orso Orseolo.[368] To be more precise, the fresco decoration was done at the beginning of the 11th century under Orso, while his brother Vitale, added the synthronon. The mosaic is from the second half of the same century. It was done by the masters from the Byzantine Empire.[369]

Since their creation, the mosaics went through a series of renovations starting already in the 12th century. The problem is that these renovations often had an impact that affected their final appearance. There is a testimony from the 18th-century restoration of the bust-like figure of St Heliodorus, where it is said that the restorer must make sure not to alter the appearance of the head of the saint. As for the bust, he will have to do it in the way he deems most appropriate, but still

---

[365] LM. Dennis, op. cit. p. 213
[366] E. Pietroni and D. Ferdani, op. cit. p. 11
[367] G. Trevisan, op. cit. p. 487
[368] L. Fabbri, op. cit. p. 3
[369] Ibidem, pp. 5-6

referring to its oldest form.[370] This example tells that there was a large part of improvisation of the restorers, for whom the original was a sort of inspiration or a model to follow, but not so strictly.

Fine or Applied Art?

Despite the interventions from a later date, the apse must be treated as an original medieval setting. Speaking of medieval art, a very important question should be posed and answered in order to decide how to treat the restoration problem. Should the mosaics and the synthronon be treated by today's understanding of art, or according to the medieval notion? To reformulate it, should it be viewed as fine or applied art?

Personally, I am more for the option of treating it in its original meaning because that is the only way we can truly respect this work of art. In the chapter dedicated to the medieval notion of the image and the church, a particularly important concept of the utility of a work of art was explained. The purpose of an image, whether a fresco, an icon, or a mosaic, was to openly and directly spread Christian messages onto the faithful. "The notion of sacredness is intertwined with the notion of functionality."[371] In the Middle Ages, the meaning and its bearer are the same.[372] This is most evident during the religious service. At that moment, the functionality of an artwork reaches its peak. In the *Dialogues* of Gregory the Great, he asks: "For, who of the faithful can have any doubt that at the very moment of the immolation, at the sound of the priest's voice, the heavens are opened and choirs of angels are presented at the mystery of Jesus Christ, that the lowest is united with the most sublime, earth is joined to the heavens, the visible and the invisible become one?"[373] Another example is the description of the interior beauty given by Gregory of Nyssa that I quoted on page 72. The same can be said for the vision of the Virgin Mary holding the infant Jesus, under whom the 12 apostles stand out surrounded by the golden background. Therefore, the role of art during the service was to help the believer overcome the material and reach the divine. Hence, if we view the apse as a masterpiece of medieval art, we neglect its non-artistic intangible

---

[370] M. Vecchi, *Torcello Nuove Ricerche*, p. 40
[371] T. Tsivolas, op. cit. p. 68
[372] Р. Асунто, op. cit. p. 43
[373] K. B. Wingfield, "Networks of Knowledge: Inventing Theology in the Stanza della Segnatura," in: *Studies in Iconography*, Vol. 38, 2017. p. 16

properties which were the main reason for adorning it in the first place. It is very important to reiterate that these objects that constitute the interior decoration of the apse incorporate in themselves "specific ideas, beliefs, and theological doctrines."[374] This goes hand in hand with the UNESCO Convention on the Safeguarding of the Intangible Cultural Heritage that treated religious "practices, representations, expressions, knowledge, skills— as well as the instruments, objects, artifacts and cultural spaces associated therewith"[375] as part of religious heritage and should not be separated from its material counterpart.

In conclusion, it can be said that for the sake of preserving the religious intangible properties embedded in the material, the decoration of the apse should be viewed, understood, and conserved/restored as a work of applied art.

<div align="center">Proposal for Practical Restoration</div>

Since the apse is viewed as applied art, before going into proposals for practical restoration, we should turn to Cesare Brandi one more time. He differs the work of art from an industrial object. In the case of the latter, restoration tends to bring back its functionality. When it comes to the works of art that have a functional purpose, such as architecture or objects of applied arts, restoring their functionality, according to Brandi, is only secondary.[376] However, when the functionality is what gives meaning to the object, especially that of a religious function that is inexplicably tied to the interior of an architectural space, restoring it should not be of secondary importance. Medieval art is a special case because its utility is realized through its aesthetics. The best unity between the concept of beauty and functionality is realized in the interior decoration of the church, in this case, the apse.

The next question is addressed to the newly discovered frescoes that adorned the walls of the apse at the beginning of the 11ᵗʰ century. If they remain visible, how does that affect the overall aesthetic unity and readability of them, of the mosaics, and of the apse as a whole? The first part

---

[374] T. Tsivolas, op. cit. p. 47
[375] Ibidem, p. 79
[376] Ч. Бранди, op. cit. p. 35

of the frescoes was discovered at the end of the 30s of the previous century.[377] They were restored and the marble slabs that covered them have been removed. The apse looked like that ever since. However, the new ones are in a very bad state. Most of the mortar is gone, and only a few figures are recognizable (the ones on the far left and far right). On top of that, the upper parts are covered with the mosaic, so it is impossible to identify who is represented. If they are cleaned, conserved, and restored, they would still remain fragments that would be hard to read and understand, especially for the tourists who are often not educated in the history of art. In Brandi's terminology, this is defined as a "ruin," i.e. an artifact that remains in such a poor condition that it is impossible to return it to its former potential unity without making a forgery.[378] However, a ruin or a fragment is still transmitted from one reality, the past, into another reality, the present. As such, it is understood as a document by using imaginative mechanisms.[379] Hence, these frescoes, or rather what remains of them, cannot be disregarded. On the other hand, if the bishops remain visible, they would add to the confusion making the decoration harder to understand. This leads to two possible solutions: return the marble slabs completely, or return the slabs partially revealing the fragments that were discovered in the 30s and the ones that have been recently discovered.

In the first case, the aesthetical unity would be fully achieved. The role of marble slabs in Byzantine art is a symbolic one as they represent the element of water or the Holy Spirit. Having them returned partially will result in partial unity of the decoration. The support for this is found in Brandi's theory of restoration. The second principle of restoration states that it should tend to reestablish the potential unity of a work of art without making a forgery, and without canceling every trace of the passage of time that is visible in the work of art.[380] At first, this might seem like an argument for keeping the parts of fresco fragments visible since they are evidence of the past times before the mosaic decoration. However, it should be noted that they originally were not meant to be seen and they are not evidence of the passage of time on the mosaic, rather they are considered an autonomous and separate work of art. Furthermore, Brandi often stated that the aesthetical principle always has priority over the historical.[381] On top of this, he states the importance of understanding the space based on the paintings exhibited in it and their relation to

[377] L. Fabbri, op. cit. p. 3
[378] Ч. Бранди, op. cit. pp. 54-55
[379] M. Popadić, *Čiji je Mikelanđelov David?*, p. 154
[380] Ч. Бранди, op. cit. p. 39
[381] Ibidem, p. 53

it. By this, he is not referring to interior design, rather to the interpretation of space.[382] This is fully compatible with the functionality of medieval architecture, its separation of the sacred from the profane, and the role of art as the bearer of intangible religious beliefs and doctrines. By returning all of the marble slabs to their place, the restorers will put the "tangible religious heritage in its wider (intangible) context."[383] Another argument pro returning of marble slabs stems from the medieval notion of art and symmetry as one of its main attributes. Even though medieval art is rather spontaneous and diverse, the idea of symmetry and balance is omnipresent.[384] Therefore, if the slabs are returned unequally, the apse loses its symmetry, and consequentially, its aesthetics is diminished.

The cons of this practical solution are seen in the loss of a historical narrative. To put in museological terms of Ivo Maroevic, both the communicational and documentational times[385] of the fresco fragments would be eliminated. Neither the public nor the experts would have the access to these fragments. If the philosophy of heritage is understood as selected memory that is crucial for preserving an identity[386], we can say that this approach would mean an open cancelation of one part of the basilica's historic narrative. However, this could be overcome, at least in the case of the expert audience, by cleaning, conserving, and making detailed documentation of the fragments before returning the marble slabs.

On the other hand, the partial return of the slabs would only partially re-establish the visual unity in the Byzantine aesthetic. The pros of this situation are that the best-looking or most easily-readable fragments remain accessible to the public. According to a different interpretation of Brandi's second law of restoration, the historical interventions, however bad they might have been, should be exposed because they too are the documents of the past.[387] What has been stated before is that every action in the domain of preservation and exhibition of heritage has a documentary duality. On one side it tends to extract and communicate the ideas embedded in the object, on the other, it is a document of its own time and practice. As a consequence, the aesthetic unity that is

---

[382] Ibidem, pp. 69-70
[383] T. Tsivolas, op. cit. p. 49
[384] K.E. Gilbert and H. Kun, op. cit. p. 119
[385] I. Maroević, op. cit. p. 117
[386] M. Popadić, *Čiji je Mikelanđelov David?,* p. 152
[387] Ч. Бранди, op. cit. p. 60

crucial for the functionality of medieval art is only partially realized, while the historic narrative is reconstructed more easily.

Where, then, is the solution to this problem? If this issue was presented a few decades ago, a serious debate might have occurred. However, thanks to the evolution of technology, part of the problem can be virtualized. I would opt for the total return of the marble slabs because the importance is given to the aesthetic principle and medieval unity. The loss of the narrative can be overcome by the use of digital tools. This is the perfect illustration of Deloche's definition of virtual as opposed to the actual.[388] While only one of the two solutions can be actualized, the other remains in the domain of potential. Therefore, the virtual solution becomes a real one that is opposed to the actualization of the other solution.

If one insists on making a compromised solution between the first two proposals, it can be done by borrowing the logic used in the church of Santa Maria Novella in Florence. In it, movable mechanisms hold the paintings in the 16th-century frames. From time to time, these paintings are "opened" to exhibit the remains of frescoes dated before Vasari's renovation. A similar thing can be done in Santa Maria Assunta, where the first set of slabs on both sides of the apse can be made movable and occasionally opened to allow for the observers to peak behind them.

29 The moving painting in the church of Santa Maria Novella in Florence to reveal the older fresco behind it

---

[388] B. Deloš, op. cit. p. 127

The last issue addressed here regarding the apse is the bishop's throne. There are strong indications that the so-called "Throne of Attila" was the cathedra of the bishop and adorned the top of the synthronon. Returning it to its original place would complete the visual/aesthetical unity of the apse that was argued before, but it would deprive the island of Torcello of its famous symbol. The solution to this problem is a rather simple one. A 1:1 scale 3D material copy of Attila's throne can be made and put in its current place in front of Santa Fosca, while the original is returned to its former place.

Virtual Proposals and Solutions

Unlike in the previous case, there are several solutions here that will be presented, giving their pros and cons. It should be noted that they all depend on what the officials who are responsible for the church intend to do. The virtual solutions, especially the elaborate ones such as virtual reality require a proper team, a significant amount of time, and, naturally, a lot of resources. However, the financial option will not be considered in the proposals here, even though for any action it is one of the crucial aspects.

The main idea regarding the apse consists of several representations of the architectural evolution of the church. In each of these, a special part is devoted to the appearance of the apse and its interior. The problem, however, arouses from the fact that the 7th-century construction is almost unknown. The size and floor plan are known, but the height and the architectural style remain beyond our knowledge. The next step in its evolution was the 9th-century renovation under the bishop Deusdedit II. The situation is better, but still not ideal. Even in this case, it is hard to make a detailed model. The best, of course, is the Romanesque 11th-century structure that was created during the Orseolean rule by enlarging the previous one. According to Trevisan, (almost) all of today's visible structure dates to the 11th century.[389] To these narratives of development, one should add the frescoed apse which is highly problematic since nothing aside from half-length figures of bishops remains. Then comes the synthronon and the Byzantine mosaics. Another

---

[389] G. Trevisan, op. cit. p. 489

important intervention regarding the apse is the addition of the Baroque altarpiece.[390] It was created in the 18th century, during the reign of bishop Vicenzo Maria Diedo (1735-1753) or Nicolo Antonio Giustiniani.[391] The final one would be Forlati's neo-Romanesque one. He excavated medieval parts of the former altar that consisted mainly of an empty sarcophagus that was used to house the relics of St Heliodorus. He reused them to recreate and set the new altar for the 1000th anniversary of the foundation of the church in 1929.[392]

All of this dynamic history of renovations and interventions should be narrated. One of the possibilities is to make material 3D models. However, these consume a lot of space. An even bigger problem is that they require more information. In the case of the first two architectural phases of the church, as well as the fresco decoration of the apse, virtually no information remains. Therefore, a lot of reinventing should be done, which leads to the forging of history. Instead, schematic 3D models that are deprived of details should be used. In this way, the architectural and artistic evolution is easier to understand, both for the professional and non-professional audience. A new question that opens up is this: how and where should these models be presented?

There are two options: the first one is on a screen; the second one is on panels. There is a common problem for both. "Positioned physical means, like information boards [, screens,] and plaques, may be helpful in providing explanations and interpretations close to the object, but they can never furnish the object with rich and deep contextual information and knowledge without cluttering the environment and thus disturb the cultural experience one initially intends to improve."[393] What is meant by this is that they often seclude parts of the historical environment. Indeed, putting large-scale panels or flatscreens inside a church does seem a bit strange. Especially in the case of the latter, where cables are also needed to provide power from the source. The solution to the problem can be to put these in a side chamber that has no function and is of no importance for understanding, experiencing, and enjoying the religious structure. In the case of Santa Maria Assunta, this can be, perhaps, in one of the rooms in the so-called fourth isle, that is

---

[390] I. Andreescu-Treadgold, "A Ninth-Century Chapel in the Basilica's Crypt at Torcello," p. 55
[391] M. Agazzi, "Corsi e ricorsi della storia dell'arte. Gli altari di Torcello e Murano dal Medioevo al Barocco e ritotno," p. 212
[392] Ibidem, pp. 206-207
[393] G. Liestol and E. Hadjidaki, "Quasi-Mixed Reality in Digital Cultural Heritage: Combining 3D Reconstructions with Real Structures on Location – The Case of Ancient Phalasarna," in: *Digital Cultural Heritage*, ed. H. Kremers, Cham, 2020. p. 424

currently used as storage. It is immensely important for the digital objects to be close to the original structure because in the perception of the visitors, the value or the importance of the virtual stems from the authority of the material original.[394] There is another reason that confirms this idea. It stems from the understanding of religious art that the common visitors often lack. T. Tsivolas noted that only "someone familiar with the conventions can understand the significance of the symbols."[395] In the domain of education, it is more useful if the object one just heard or learned about can be experienced immediately, especially if the person is not familiar with the language of the symbols, as is often the case with religious heritage and art. "It will often be completely impossible for the visiting layman to understand their original shape, use and significance."[396]

30 Usage of flat screens and information panels for educational purposes

Augmented reality might be another helpful tool for visitors to use. Currently, there are two different functioning logics of applications in our everyday devices: 1. Computer vision-based registration/pattern recognition, and 2. Sensor-based registration. The first one is based on a pattern that is recognized by the phone that shows the 3D model on the screen. This model corresponds with the object in the frame of the screen/in reality in front of the observer. The idea is the same in the latter case, but the system is based on hardware sensors (like GPS) that follow the movement

---

[394] F. Cameron, op. cit. p. 56
[395] T. Tsivolas, op. cit. p. 46
[396] G. Liestol and E. Hadjidaki, op. cit. p. 424

of the device, constantly trying to update the object on the screen in accordance with the real one.[397] The second one is less applicable in the case of cultural heritage. If one of the two had to be chosen, the first one would be better. However, it also has a flaw. Mainly, the device/the phone needs to be constantly in contact with the marker in order for the object to be maintained on the screen. If it is moved away, or if a person comes between them, the model collapses.[398] Hence, even if a marker is placed in the church that would allow for the visualization of the former apse

31 Indirect Augmented Reality use for the apse of Santa Maria Assunta

appearance, there is a high chance of probability that it would often be interrupted by other visitors.

The next step in the advancement of such technology is Indirect Augmented Reality (IAR). "A large array of video cameras and other sensors that would capture, in real-time, the real environment and permit a perfect reconstruction of that environment, in real-time, as seen from any arbitrary viewpoint."[399] As a consequence, if a viewer aims his/her phone towards the apse,

---

[397] Ibidem, p. 424
[398] Ibidem, p. 424
[399] Ibidem, p. 425

he/she would see a corresponding virtual reconstruction on the screen. The practical use of IAR so far was mostly limited to outdoor sites and archaeology. It is a complex technique that brings us back to one of the starting questions: how is this tool adding value to the project? In the case of the apse of the basilica in Torcello, not much. The reconstructions that would be viewed on the screen of the phone are appealing but they can be viewed, on a much smaller budget on a flat-screen in the annex chamber with other digital models. Using the IAR for the sake of its attractiveness would be fetishizing technology. Another risk, that is applied also to VR, is that a certain percentage of users would focus "on the process of using the technology, rather than on the content."[400]

If, however, one wants to invest in high-tech equipment that enhances the experience of visitors, a far superior tool is a Virtual Reality model. Before any further elaboration of its usage, it should be noted that VR involves the space around the observer. As such, it is often not acceptable in museum spaces, especially in a church. It also often threatens to become the protagonist instead of the real object.[401] This can be overcome by placing it in a separate room that has no historic importance and is deprived of any artifacts. As proposed earlier, the one in the adjacent part of the church would suit this purpose nicely.

Before getting back to VR and its advantages over IAR, it should be stated that both allow the observer to view the unequal equivalents of the starting material object.[402] Both of them show it in a hypothetical state of its former existence that as such, never happened. What, then, is the difference, and where lies VR's advantage? It lies in its use of the screen as a phenomenon. In the case of IAR, the visitor holds the device that allows for a visual overlap. However, the edges, or rather the limit of the screen are clearly visible allowing for a perfect distinction between the real and the virtual. In the case of VR, the dynamic screen covers the whole field of view canceling all visual/mental connections that its consumer has with his/her surrounding.[403] Instead, the viewer is instantly and mentally transported into the domain of the virtual[404], allowing for a fuller experience that satiates the visual (and other) sense in a more comprehensive way.

---

[400] M. Economou and L. Pujol Tost, 247
[401] Ibidem, p. 248
[402] B. Deloš, op. cit. p. 127
[403] L. Manovič, *Metamediji*, p. 14
[404] O. Grau, op. cit. p. 271

The proposal for use of VR would be the presence in a sequence of a virtual medieval service. This is envisioned following the concept of "electrification of imagination" that allows the viewer to experience the past and "cross centuries."[405] The inspiration for this idea came from the (at that time) groundbreaking VR pilgrimage in the Cluny Abbey that was presented in 1993[406] and became one of the most revolutionary innovations in the application of new technologies in cultural heritage. Another reason is a parallel that can be drawn between a tourist and a pilgrim. "In the traditional pilgrimage, the pilgrim followed an itinerary dotted with stages and high spots, the completion of which was a rite of passage or an initiation. From this perspective, tourism to the historical monument is not just a form of sightseeing; it is also an opportunity for a form of spiritual contemplation, direct experience, and immersion in the past."[407] This is especially true in the case of religious monuments, such as the church of Santa Maria Assunta.

32 An illustration of the potential VR reconstruction of a service held in the 11th century in the basilica of Torcello

---

[405] H. Thwaites, op. cit. p. 337
[406] P. Boniface, op. cit. p. 87
[407] B. Flynn, op. cit. p. 362

The religious aspect can be further enhanced by stimulating the original use of the object, i.e. holding services in the basilica. However, since this probably will not be an option, a ritual aspect can be simulated through the use of VR. It "can include various nonmaterial aspects such as symbolism, ideology, and ritual; a concern with the social and abstract dimensions of heritage, ceremony, and the creative use of aesthetic objects and spaces."[408] Through a stimulating setting like this, it can allow for a more personal relationship between the visitor and the represented object. "Given the idiom 'seeing is believing,' the realism achieved by modern visualization systems could lead the users to perceive the virtual model as 'truth' instead of as the result of interpretation."[409] This is unlikely in the case of Torcello because with the return of the slabs in the apse, the visual difference between the virtual and the real would be a matter of atmosphere, not the artistic aesthetic. The viewer would experience something that is otherwise inaccessible, something for which the apse with its synthronon, mosaic, and marble slabs would serve as a scenography. The idea is that a description of a medieval service, that is today completely abandoned in the sense of its atmosphere, no longer needs to be just a written description. One such example is this:

> "Churches themselves were organized in such a way that allowed for a controlled amount of light to penetrate inside, that is in the amount needed by the type of a service in its particular segments or prayer. To this light was, in particular moments, added the light of one, two, three, or more candles. All of this was done with the purpose of increasing the effect of the service, to firmly tie the believer with a certain religious act, and to achieve greater aesthetical performance and a more intense emotional experience… Hence, the images, frescoes, and mosaics were filled with light. This light manifested itself intensely with the emphasis on the golden background that is characterized by a strong sense of dynamism under the influence of outer factors such as the Sun, the wind that directs the flame of numerous burning candles, censers, and thuribles from which smoke of frankincense twists out having a slightly alluring effect, all of which impacts the experience of light."[410]

A similar example is the description of Gregory of Nyssa that is quoted on page 72. These vivid examples can become even more vivid through the use of VR. In real life in the 21st century, no church is going to light hundreds of candles to illuminate its interior. In the case of Santa Maria Assunta, it is unlikely that a large congregation of believers would gather to attend the mass. On the contrary, this can be accurately reproduced and visualized in the virtual domain. I reiterate,

---

[408] Ibidem, pp. 353-354
[409] E. Pietroni and D. Ferdani, op. cit. p. 7
[410] R. Đokić, *Istorija estetike III*, p. 273

there is no fear of virtual competing with the real, as it would be clearly presented as a didactic tool with the aim of compensating for the lack of possible experience. This is because "in a simulation environment, presence and excitement are privileged over the reflection and contemplation associated with direct experience at the monument."[411] The contemplating part can be done in direct contact with the work of art in its original setting, i.e. the central nave of the church. The "excitement" is reserved for the VR domain in the adjacent room.

There are, however, a few important remarks that can be said about the use of virtual reality in cultural heritage: 1. The immersion into the virtual does not equal knowledge gaining; 2. Realism can act as a distractor from the content; 3. VR eliminates the communication within a group; 4. VR imposes its own narrative on the viewer.

Regarding the first problem, the "users needed to have the representation codes of the original knowledge domain, otherwise the immersive application would become another source of problems, added to those which arise while trying to understand the content."[412] Basically, the same problem as with viewing a work of art without any previous knowledge. To overcome this, the use of a VR headset would be assisted by a staff member or a plaque explaining its purpose and content.

One particular characteristic of VR is its alluring realism and the ability to accurately reproduce physical reality. According to certain studies quoted in "*Educational Tool or Expensive Toy? Evaluating VR Evaluation and its Relevance for Virtual Heritage*" by M. Economou and L. P. Tost, a more detailed version of virtual reality is not necessarily better. On the contrary, it can distract the user from the point of the content. "Simplified or abstract representations can be more effective."[413] In the case of the common audience, as mentioned above, details often distract resulting in a lack of obtained knowledge. When it comes to professionals, the abundance of details is not important since they "can work with increased levels of abstraction." In the case of my proposal, the context justifies the details. I would deliberately focus on a more detailed simulation because the purpose of it is the experience. The educational part is done by the digital models and other visual tools before a user reaches the headset.

---

411 B. Flynn, op. cit. p. 363
412 M. Economou and L. Pujol Tost, op. cit. p. 254
413 Ibidem, p. 254

The third remark is a valid one and cannot be countered. It is in most part the fault of technology as it often prevents a group from collectively enjoying a simulation. However, it can, in part be overcome by increasing the number of digital equipment. Still, the connectivity and the interaction in a group would have to be tested for any further conclusions.

Another important aspect that can be added to this remark, is the passive approach to the user. In the case of our virtual model, "the spectators have no possibility of performing an active role in the knowledge process. They can of course acknowledge and reflect on what they have seen and heard, but without the possibility of interacting, performing actions, or obtaining different feedback."[414] At first, this might seem strange since VR is often associated with the so-called MMORPGs and their "user-driven navigation."[415] Why would the viewer be denied a chance to have a stroll around the virtual basilica? There are a few reasons for this decision. Firstly, the virtual model is that of the apse itself, not the whole church. If the setting is during service, there is not much space for the viewer to move around. Secondly, the movement in the virtual space requires also movement through the real one. The size of a room used for VR needs to be that of the building itself, or at least large enough as its main part for the observer to go into spatial exploration. This is not the case with the church in Torcello. While writing these proposals, I was trying to think realistically and put my hypothesis in real settings and possible scenarios. The third and final reason is the respect for the religious heritage and the cult church. Even though VR is associated with role-playing games and can be used to make some related to cultural heritage (the example of the temple of Mars Ultor in the Forum of Augustus[416]), the idea is to preserve a level of respect. By this, it is not implied that the creators of the Forum game disrespected it, but it is different when it comes to recreating a VR game in the ruins of ancient Rome and using VR for an object that is part of the largest active religion in the world. I personally do not see enough material in the church itself to turn it into a game, nor do I see the need. If one insists on doing something similar to that, I would advise making one that encompasses the whole island of Torcello with a narrative in which the basilica of Santa Maria Assunta will only be one of the parts.

[414] E. Pietroni and D. Ferdani, op. cit. p. 12
[415] M. Economou and L. Pujol Tost, op. cit. p. 354
[416] E. Pietroni and D. Ferdani, op. cit. pp. 22-24

In addition, studies have shown that "narration emerges as the most powerful component of the experience, and secondly interaction."[417]

The last sentence brings me to the fourth and the last remark that is made towards the persuasiveness of VR. "Certainly, a compelling visualization can make itself 'easy to love and difficult to doubt'."[418] Because of this, it needs to be clearly stated that virtual reality is a hypothetical simulation or a visual interpretation of certain data. The whole problem of the narrative of virtual reconstructions has already been explained in the chapter "Reconstruction Problems." One can indeed make a remark about how the guided tour leaves more space for imagination, and it would be fully valid. However, imagination is highly personal, and not everyone has the ability to mentally recreate an 11th-century religious service. Also, the usage of VR technology is not mandatory. Those who prefer to stroll around and absorb the current atmosphere of the church are fully encouraged to do so.

33 An illustration of virtual restoration of the bishop frescoes in the main apse

---

[417] Ibidem, p. 14
[418] A. Watterson, op. cit. p. 122

In conclusion, the marble slabs and the throne of Attila should be put back as an aim to restore the aesthetic unity of the apse. It would further contribute to its functionality in the religious interior. The fresco fragments that would be covered by the marble slabs would be visible in digital reconstructions. In the adjacent chamber, information panels or screens should be put. They would demonstrate the architectural narrative of the church through 3D models while providing the necessary information to the visitors. Instead of using AR, MR, or IAR, it is better to invest in a VR version of the apse, that would help the viewer to experience, and through it understand the purpose and function of art in the Middle Ages by being present in an 11th-century service.

The Restoration of the Crypt

The 9th-century crypt with its marble pergola and its missing starry sky poses another conservation problem that requires a different approach than that of the apse. It was already mentioned that it represents a confessional modification of the typical oriental crypt that was done to accommodate the needs of the western devotion.[419] Another important aspect of it has also been mentioned, the reconstruction of the pergola done by Andreescu.[420] In my thesis, I will fully accept her hypothetical reconstruction, as it is the most plausible one so far. What is known about the crypt is that it was probably dedicated to St Martin, and its use was abandoned by the end of the 17th century.[421]

The starting conception for conservation of the crypt is similar to the one of the apse but will result in a quite different approach. It follows the idea of B. Deloche that an object is used to express an experience.[422] In this case, the "object" is the whole structure of the crypt and the ritual process of going down and up. This also goes hand in hand with the understanding of religious heritage as expressed by T. Tsivolas, who argued that its use should be restimulated.[423] To be able to restimulate it, we need to understand its purpose. In Catholicism, the purpose of the crypt was to house the relics of a saint and allow for the flow of the faithful to pass through it and pray. It

---

[419] L. Fabbri, op. cit. p. 8
[420] I. Andreescu-Treadgold, "A Ninth-Century Chapel in the Basilica's Crypt at Torcello," pp. 60-61
[421] Ibidem, p. 7
[422] B. Deloš, op. cit. p. 77
[423] T. Tsivolas, op. cit. p. 70

was constructed in such a way that this activity could be carried out without interrupting the service in the main nave.[424] If a parallel could be drawn with the description provided by Gregory of Nyssa[425], it would be concluded that such an interior had a particular decoration that stimulated the believers to adore the relics. In the case of the basilica in Torcello, the main parts of the crypt's interior were the pergola that housed the relics of St Martin, and the vault painted with a starry sky. Since the marble reliquary has been dismantled and the paint on the vault survived in two minuscule fragments, two conservation problems have been opened.

Reconstructing the Pergola

As was mentioned earlier, the relics are the reason a crypt is constructed. Hence, depriving this structure of the material object that was used to house the relics would be denying it of its purpose. This is directly opposed to the theory of medieval art, according to which the utility of the object is what gives it its beauty. Therefore, it is of utmost importance that the pergola be reconstructed if the revitalization of the crypt is to be carried out.

Originally, it was made in parts that were assembled *in situ*. At a certain point, it was dismantled, and most of its structure currently forms a part of the "so-called *lavabo* in the northeast annex that also used to serve as a modern Sacristy."[426] The main question regarding conservation that arouses now is: should it be reassembled again and placed in its original place in the crypt? I would say yes. The argument is based, once again, on Brandi's theory and the unity of an artwork. According to him, the form of an artwork is inseparable, and in the case of its dismembering, a potential unity should be reestablished.[427] However, adding the missing parts must not be based on analogy. But, what can be done is to follow the suggestions embedded in the surviving fragments, without violating the aesthetical-historical polarity and creating a forgery.[428] The reconstruction that Andreescu made is precisely this. Based on a close examination of the style,
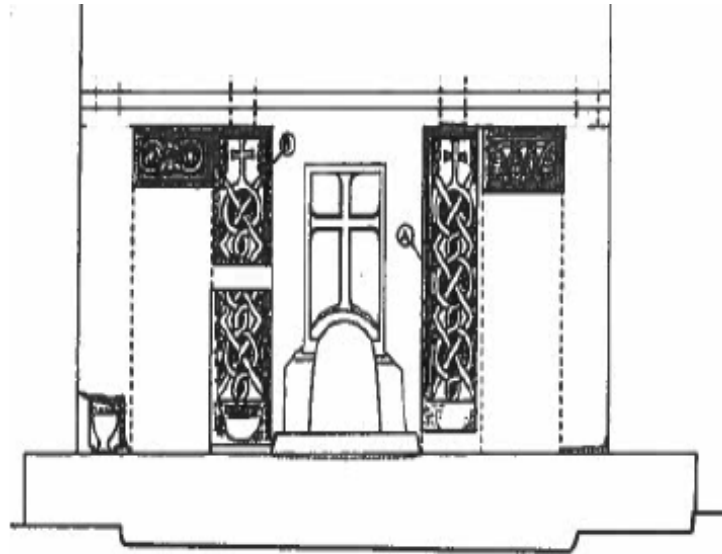
---

[424] L. Fabbri, op. cit. p. 7
[425] D. Iozzia, op. cit. pp. 49-51
[426] I. Andreescu-Treadgold, "A Ninth-Century Chapel in the Basilica's Crypt at Torcello," p. 57
[427] Ч. Бранди, op cit. p. 45
[428] Ibidem, p. 46

the material, the technique, and the dimensions, she identified parts that potentially constituted the pergola.

34 The reconstruction of the crypt's pergola according to Andreescu

Of course, re-creating it would mean that the *lavabo* in the sacristy would have to be dismantled. Given the fact that it is inaccessible and that it has no artistic and religious value or at least drastically less significant one than that of the pergola, there should be no problem in dismantling it. If, however, the official staff of the church or the restorers do not wish to do so, the same logic as with the throne of Attila can be used. Each of the parts can be copied, and these would then be put in the original place. However, with such an action, there is a risk of fooling the viewer and creating a historical fake, which is ethically unacceptable.

If none of the two options suffice, there is a virtual alternative. The same methodology as it was used in the exhibition "Keys2Rome" in 2014 and 2015 could be used. Of the two virtual restoration techniques, AR and "revealing flashlight", the second one is more suitable for the crypt. "The application allowed users to discover original colors and drawings of fragmented marble slabs… The application worked as follows: the user pointed to an area of the marble fragments with his/her finger; an infrared sensor, connected to a PC and a projector, tracked and interpreted the movements of the hand; finally, a beam of light was projected only in the area indicated by the user, reproducing the original colors onto the artefact."[429] In the case of the pergola, the missing

---

[429] E. Pietroni and D. Ferdani, op. cit. p. 25

parts and their floral motifs would be projected onto the current flat marble screen. This way, no physical intervention would be needed because the whole process would be carried out by virtual restoration. The viewer would instantly see the parts that are no longer visible because the light would temporarily restore the fragmented form of the original.

All the Stars in the Sky

The second, and certainly more complicated issue is that of the missing vault decoration. Based on the few minute fragments that still remain on the walls of the crypt, it has been inferred that the vault was fully painted with a blue color imitating the sky. This simulated sky was adorned with stars. Following the concept of the church as a reference to God, the divine architect[430], and its role to unite the otherworldly and man-made structures[431], it is quite logical that the ceiling needs to imitate the heavens. In the Platonic or rather a Neoplatonic tradition, the heavens are the least material of all the material things, since they are closer to the Creator. According to the 7th-century monk from mount Sinai, John Climacus, the "stars are the beauty of the heavenly vault."[432] Hence, it is of great importance that this type of decoration should again be brought back into the crypt of Santa Maria Assunta. The question is how can this be done and what would be the best tools for it?

The first option, aside from leaving the crypt as it is, is to repaint it. This action would be a renovation and not a restoration. "The term renovation (Lat. *renovare* > to renew) is often incorrectly used interchangeably with restoration. Rather, it is a way to renew something old, and it does not necessarily have to bear ethical aspects of the preservation or conservation of old parts."[433] According to Brandi, a reconstruction aims to annihilate the time span, and it does so in two possible ways: 1. By imitating the time period in which the previous intervention was done; 2. By absorbing the previous intervention in itself.[434] With the term "previous intervention", Brandi is referring to, in the case of the crypt, the original decoration. So in the first case, the

---

[430] K.E. Gilbert and H. Kun, op. cit. p. 118
[431] R. Đokić, *Istorija estetike III,* p. 269
[432] Ibidem, p. 269
[433] Q. Santana, op. cit. p. 17
[434] Ч. Бранди, op cit. pp. 59-60

intervention/reconstruction would tend to create a new vault painting that would, in its style, imitate the original 9th or 11th-century art. This would be a forgery. To be more specific, it would fall under the category of "counterfeit without a template."[435] As such, it is ethically unacceptable. On the other hand, Brandi approves of the second logic that would create a whole new object, although this is not regarded as a restoration practice.[436] This is deemed important as it would contribute to a better interpretation of the spatiality[437] as was argued above in the theory of medieval art and architecture.

In the annexed chapter titled "Principles for Monument Restoration," Brandi asks a very important question: Given that a natural or a monumental ambient is not deeply transformed in its spatial characteristics, except for the vanishing of one or more elements, would their reestablishing be acceptable through the use of copies, that in themselves are forgeries, based on the spatial renewal of the ambient, when the revitalization of the monument is impossible? The answer that he provides is that it is possible to add the missing elements back as long as they initially were not a work of art.[438] However, the problem that arouses is how are we going to view the original decoration? In today's notion, it would be a work of art and consequentially, its renewed edition would be unacceptable. On the contrary, a whole chapter that explains the understanding of medieval art as inseparable from its function was presented earlier. In this case, it is even more complex because the painting was an integral part of the architecture. That decoration was viewed as a functional symbolic element that drew its value from its representation and its location. On top of that, its location functioned as a symbolic element for the architecture that it adorned. If importance is given to its functionality, adding the missing decoration becomes justified. "The numinous/aesthetic synthesis, which is defined as the inner unity of the products of religious culture, becomes quite obvious in the case of religious (movable or immovable) elements, that still maintain a liturgical function."[439] Even Brandi, himself, approves of adding new parts in accordance with the previous structure. An example is the campanile of St Mark in Venice, for which he says that an accurate reproduction (a copy) was not required, only the presence of a

---

[435] I. Maroević, op. cit. p. 158
[436] Ч. Бранди, op cit. p. 60
[437] Ibidem, p. 69
[438] Ibidem, pp. 90-91
[439] T. Tsivolas, op. cit. p. 46

vertical element that fulfills the urbanistic function.[440] It can be concluded that adding a new object in a historic interior is justified as long as it is not a copy, but an entirely new object. In the case of the crypt, a copy is impossible to make because almost nothing remains of the previous decoration.

If, however, all of these theoretical debates about the authenticity and forgery of historical documents seem too complicated, a simpler solution can be found in the virtual domain. Similar logic to that of the pergola can be proposed. Instead of a light that would follow the movement of the finger, an installation of a lighting system for the whole vault would be more efficient. In this way, stars could be seen without making a historic forgery because no material intervention whatsoever would be done on the vault. Another advantage of this type of technology is in its effect on the group of visitors. "Augmented (AR) and Mixed Reality (MR), with their closer link

35 An illustration of lighting system for the "starry sky" effect

---

[440] Ч. Бранди, op cit. p. 67

to the physical environment and their less obtrusive character, are supposed to offer the advantages of VR without disrupting social interaction."[441] Another reason why VR in the case of the crypt was not proposed, is that sometimes the virtual cannot comprehend for the lack of materiality. "The experience of an object in the social and ritual space of the museum apart from the everyday also differentiates its psychological effect from its digital surrogate."[442] And the whole purpose of the crypt is in experiencing its ritual function. Even for non-religious visitors, it would be interesting to go underground and discover what is inside the crypt.

In conclusion, the pergola can be partially recreated by using the available fragments. If this option is denied, a system of "revealing flashlight" can be used as a very successful tool that, in itself, encompasses all the postulates of virtual restoration. As for the vault with the starry heaven, I would propose either the option of repainting it anew or using a system similar to AR for an ethically safer solution.

The Diaconicon Murals

In 2020 new wall paintings were discovered above the diaconicon mosaic. They are dated to the 9th century since their style corresponds to Carolingian art.[443] This is in accordance with the style of the first decoration of the Doge's chapel in the early 9th century. It is described as northern Adriatic or Carolingian before it became the church of St Mark.[444] Historically speaking this is reasonable to believe as at the beginning of the 9th century and in the second half of it, Venetians had a quite good relationship with the Frankish kings.[445] As was mentioned earlier, Torcello was not very far from the pilgrimage route that went through South Tyrol where most of surviving Carolingian frescoes are preserved.

[441] M. Economou and L. Pujol Tost, op. cit. p. 244
[442] F. Cameron, op. cit. p. 63
[443] An article that describes their discovery: https://www.historywalksvenice.com/2020/07/new-frescoes-in-the-torcellobasilica/#:~:text=The%20'new'%20frescos%20are%20from,ceiling%20was%20full%20of%20debris. [10. 2. 2022]
[444] D. Calaon, "Ecologia della Venetia prima di Venezia: Uomini, Acqua e Archeologia," p. 805
[445] S. Gasparri, "The First Dukes and the Origins of Venice," p. 25

These newly-discovered murals are in very bad condition and it is hard to interpret their content accurately. In the one above the entrance to the crypt is the figure of St Martin, which is identifiable thanks to the inscription above him. He is next to a significantly lower figure, and they are both depicted in front of some background architecture. Whether St Martin is riding a horse, or the other figure is kneeling, is impossible to deduce. Perhaps, it is not even the depiction of the most famous scene from the life of that saint. What is very interesting to note is that the crypt was supposedly dedicated to St Martin, who is one of the most celebrated Benedictine saints. With this
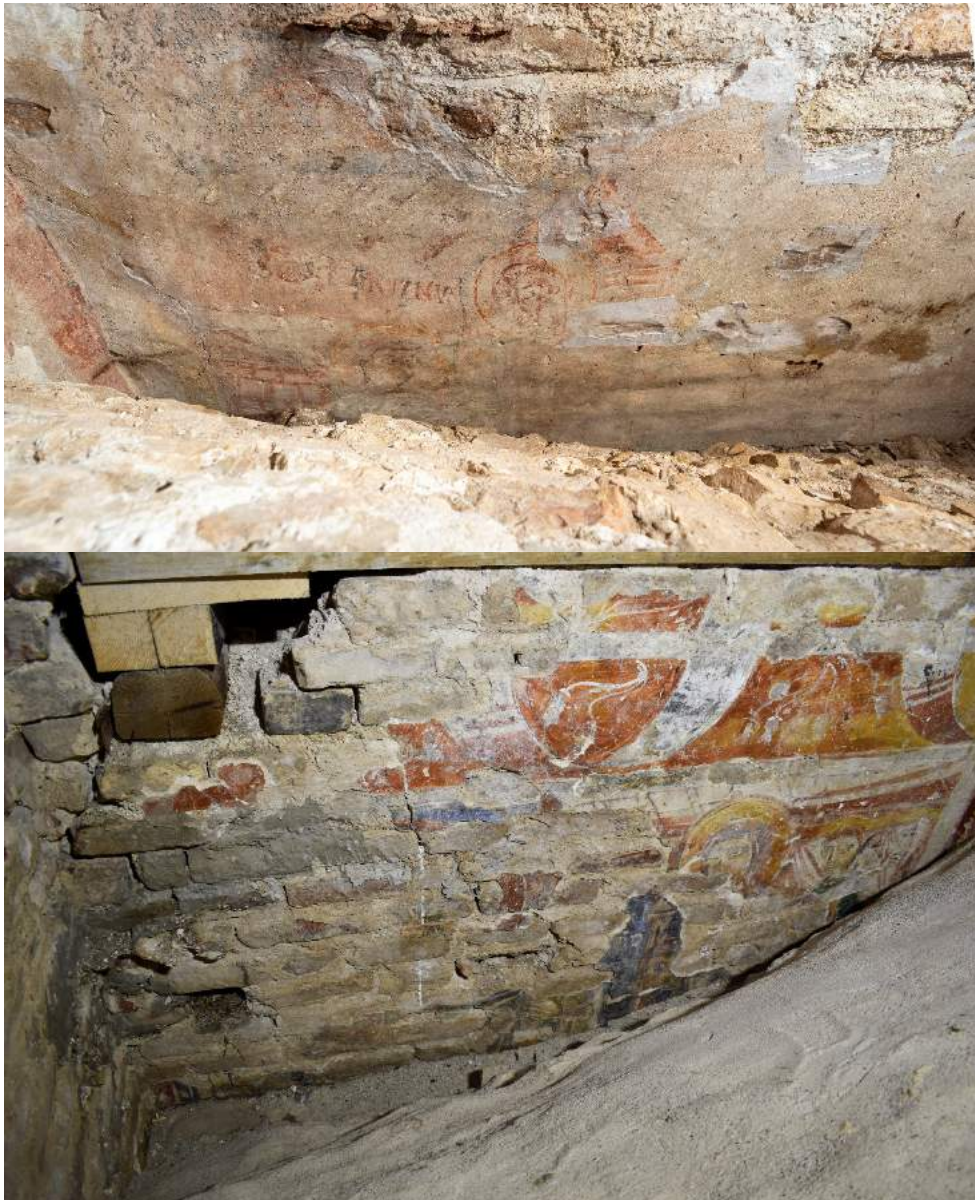
36 Upper picture: St Martin; Lower picture: Annunciation (?)

new discovery, the suspicion of Andreescu about the dedication of the crypt becomes justified.[446] The masters who made the mosaic in the diaconicon probably substituted the figure of St Jerome deliberately to indicate the cult of the Frankish saint. On the other wall, the opposite of St Martin is a scene that was identified as Annunciation. Unlike in the former example, there is no inscription that allows for the naming of the scene, except for two letters that can be read either as "ar" or "or." Only part of the head of the Virgin Mary can be seen, sitting in a space defined by architecture. Behind her is another figure pulling the curtain.[447]

The problem with these frescoes is completely different from that of the previous two cases. Here, the real question is their accessibility, or rather their inaccessibility. They are located between the upper part of the mosaic and the roof of the side aisle. Neither the experts nor the common crowd can see them. In Maroevic's terms, both the communicational and documentational times are canceled.[448] What should be done in this case? The simplest possible solution is to make high-quality photographs and print them out on a 1:1 scale, and as such exhibit them in the museum. However, this would be the least creative option and the one that would not be very useful for the visitors.

Another option is to make a copy and exhibit it. This opens up a whole field of theory related to the copy as a phenomenon, its relation to art, its role in a museum, and its potential as a didactic tool. "In the strict sense, virtualization is moving from one artifact to others, which are substitutes."[449] The virtualization here is understood more philosophically than in the previous cases. The substitute that B. Deloche is mentioning can be equated with the term "copy." Brandi defines it as an object that reproduces another one in its technique and style without any other purpose aside from documenting it or enjoying it.[450] According to him, it can be justified only with a didactic or memorial purpose, but it cannot be a substitute for the original.[451] Otherwise, it becomes a forgery. Following Brandi's strict and rather sterile notion of the copy, we can still

---

[446] I. Andreescu-Treadgold, "A Ninth-Century Chapel in the Basilica's Crypt at Torcello," p. 62
[447] A personal observation is that the remaining letters are the ending of the name of one of the magi (Melchior, Balthazar, Caspar) that came to adore the infant Christ. Thus, the whole scene can be interpreted as the Adoration of the Magi. The Virgin is seated on a throne with (possibly) one of the magi kneeling in front of her. The figure on the right can be interpreted as Joseph, or a maid. Similar representations can be seen in medieval manuscripts.
[448] I. Maroević, op. cit. p. 117
[449] B. Deloš, op. cit. p. 137
[450] Ч. Бранди, op. cit. p. 79
[451] Ibidem, p. 67

make it and put it in a museum. However, other thinkers see a richer potential in that term than C. Brandi.

According to Deloche, the purpose of the substitute is to take the place of the missing object.[452] The frescoes in the diaconicon can be called "missing" since their location makes them completely inaccessible. For Malraux, this mechanism is what preserves heritage.[453] This "taking the place" and "heritage preservation" take place in a museum. There, the substitute enjoys its double historicity reflecting a cultural trend that caused its creation.[454] According to Maroevic, the substitutes that enter a museum eventually become part of heritage[455] exactly because of the previously given reason.

Maroevic distinguishes 4 different types of copies that can be used in a museum or an exhibition:

1. Copies that are made because the original needs to be protected or cannot be brought into the museum.
2. Copies that are made as reconstructions of damaged or lost objects. In this case, it is not a replica but a possible interpretation.
3. Original museum objects that were purchased because they are copies of another object.
4. A substitute for the original but in another medium. An example is a photograph.[456]

The copy that would be proposed to be made obviously belongs to the first group. However, it can also be used for a particular version of the second category. Just as was the case of the virtual Zeus that went on exhibitions and was exposed to situations and contexts inaccessible to the material original[457], so too can be done with the material copies. They allow treatment and experimentation that is impossible for the original.[458] In the case of Torcello, the missing parts of the scenes can be finished in different ways allowing the professionals to test different hypotheses and maybe make new discoveries.

---

[452] B. Deloš, op. cit. p. 158
[453] Ibidem, p. 163
[454] Ч. Бранди, op. cit. p. 80
[455] I. Maroević, op. cit. p. 159
[456] Ibidem, p. 157-158
[457] F. Cameron, op. cit. p. 66
[458] B. Deloš, op. cit. p. 159

A fine example of using new technologies in the conservation of wall paintings is the Vasari project that applied photogrammetry to make copies. "The Vasari project and the study of Pre-Hispanic murals in Mexico have applied photogrammetry, building a 3D model for the conservation and restoration of paintings that face danger in their preservation. Such parameters as spectrum, color, levels of detail, and geometric accuracy were taken into account in documenting the murals. Digital photogrammetry enables the enhancement of geometric accuracy."[459] This same technique can be applied in Torcello producing two 1:1 scale copies of the murals in the diaconicon. As such, they can be exhibited in the museum on the island. On the other hand, if one wants to avoid using technology, for example, because of its costs, an artistic copy can be done instead. It is certainly less expensive and less time-consuming, especially since the creator would have to imitate the fresco technique which needs to be produced in a few days. It would probably be heavier and as such more complicated to maneuver. However, the general properties of both approaches are the same, since both of them fall under the first category according to Maroevic.

The last thing that needs to be mentioned and explained is the context of the copy. A quotation of Jean Clair related to the copy of Paolo Veronese's "Le Nozze di Cana" in the monastery of San Giorgio Maggiore is quite fitting for the problem of Torcello frescoes as well. "What is better: the distorted and deteriorated work, badly illuminated and completely out of context, or the copy, of superior quality to the original, whose re-contextualization restores its reason for being?"[460] The same question can easily be applied to the copies of the diaconicon frescoes. The main conclusion is that the context, just like in the case of virtualization, justifies everything. In the proposal for the diaconicon murals, the use of photogrammetry to make the two copies and exhibit them towards one another the same way they are in the original place would be more than fitting. By using the additional construction, the whole upper part of the diaconicon can be simulated, making it perfectly clear for the observer where the frescoes are located. This logic is borrowed from the museum exhibition of the Ravenna mosaic from San Michele in Africisco that is now in the Bode Museum in Berlin. It is presented in a way that makes it clear for the viewer where the original stood, but also allows him/her to approach it and view it up-close.
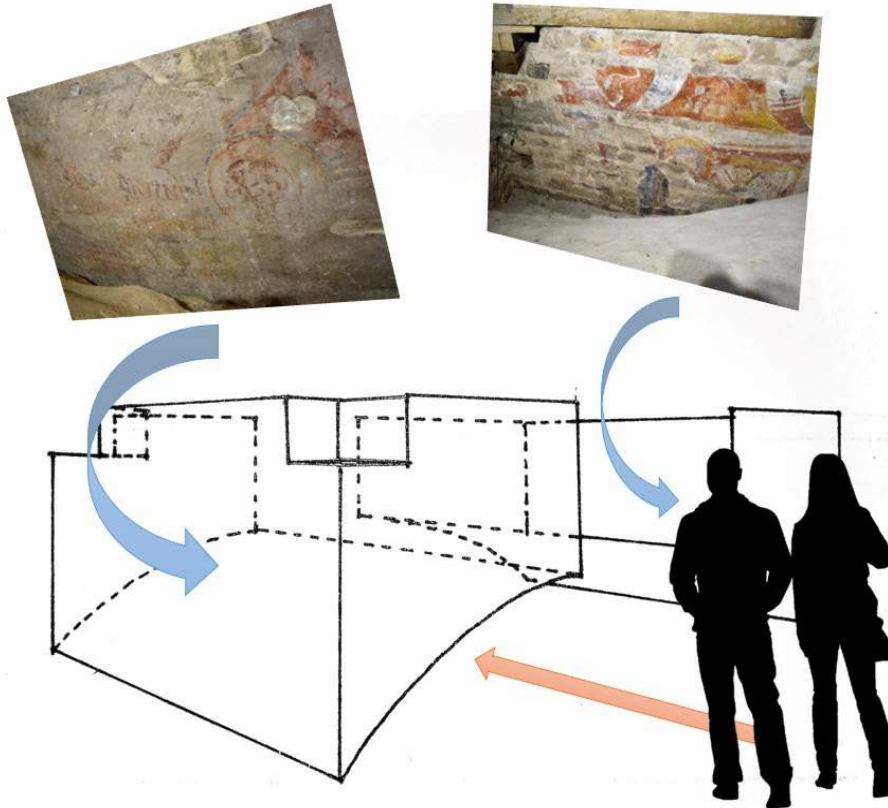
---

[459] M. Silver, op. cit. p. 57
[460] E. Pietroni and D. Ferdani, op. cit. p. 26

37 The exhibition of the mosaic from San Michele in Africisco (Ravenna) in the Bode Museum in Berlin

38 The illustration of the museum exhibition that would simulate the position of the original murals

The other option, if copies are not suitable and one prefers to have the original, is to remove the frescoes using one of the detachment techniques.[461] This would permanently sever their bond with the original context for which they were made. Any further spatial study would be severely crippled by this action. On the positive side, the scenes and the iconography can be better studied for a longer period. The visitors would also be in contact with the original aura. Still, a substitute in a museum is preferable, leaving these in their original place. Maybe in the future new discoveries will be made and these frescoes would turn out to be invaluable sources of information.

In conclusion, copies can be a perfect didactic tool that substitutes the inaccessible originals and are often able to convey messages to the public in a better way. For this reason, the preferable option is to make 1:1 copies of the diaconicon frescoes and exhibit them in the Torcello museum simulating their relationship with one another and the surrounding space. This can be more useful for the tourists, but also for the experts in a certain way.

---

[461] Wall paintings can be moved by being separated from a wall as part of a conservation process. This is nowadays done rarely, as they lose the connection with their original space. The three basic techniques are: *strappo*, *stacco*, and *stacco a massello*. The first one removes just the painted layer, the second one the paint layer with the *intonaco*, while the last one takes also a part of the wall as the main bearer.

Appendix I: Agisoft Metashape Models

This part is dedicated to the models I made using Agisoft Metashape software for image matching. "Agisoft Metashape is a stand-alone software product that performs photogrammetric processing of digital images and generates 3D spatial data to be used in GIS applications, cultural heritage documentation, and visual effects production as well as for indirect measurements of objects of various scales."[462] Using it, a total of 10 3D models were made: 4 altars in the church, 2 angel sculptures from the Baroque altar in the diaconicon, the smaller outer apse of the crypt, the western portal of the front façade, the synthronon, and the diaconicon frescoes. Before going into the models themselves, the technique of photogrammetry will be described, relying on the explanation provided in chapters 5.6 and 5.7 of E. Stylianidis, A. Georgopoulos, and F. Remondino's '*Basics of Image-Based Modeling Techniques in Cultural Heritage 3D Recording*' in "3D Recording, Documentation and Management of Cultural Heritage."[463]
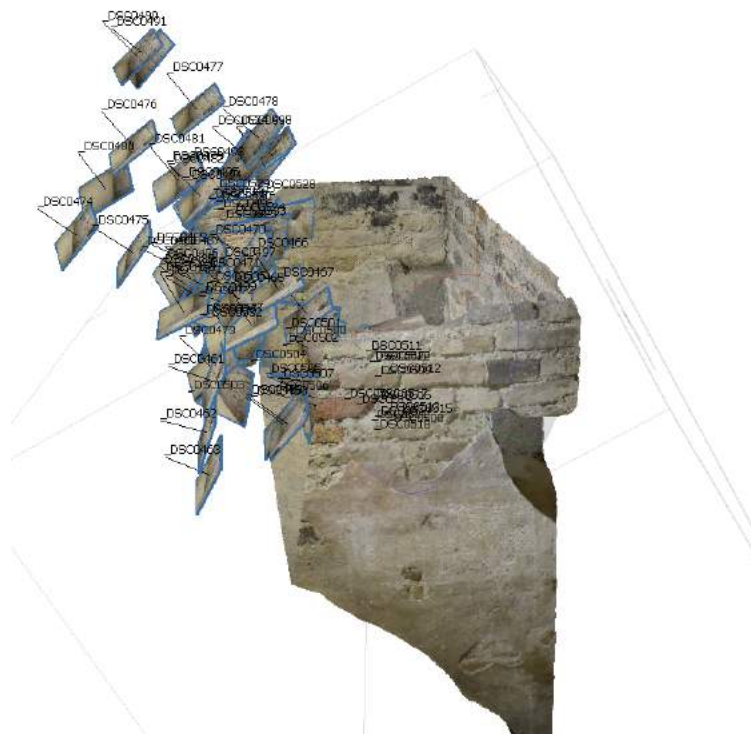
37 Positions of the photos taken to make a 3D model

---

[462] The official website: https://www.agisoft.com/ [12.2.2022]

[463] E. Stylianidis, A. Georgopoulos and F. Remondino, "Basics of Image-Based Modelling Techniques in Cultural Heritage 3D Recording," in: *3D Recording, Documentation and Management of Cultural Heritage*, ed. E. Stylianidis and F. Remondino, Dunbeath, 2016. pp. 290-302

The first step that one needs to do to make a 3D model in Agisoft Metashape, is to make photographs of the object he/she wants to visualize in the software. The object must be photographed from every angle in such a way that the photos overlap each other for about 70%. This is required for the software to be able to match them. "Most of the proposed matching methods are based on similarity or photo-consistency measures; in other words, they compare pixel values between the images."[464] It should be noted that the matching process can be done between maps and 3D models as well. As a result of finding the correspondences between points, a depth map (in the case of images) or a point cloud (in the case of 3D objects) is made.

The next step is photo alignment. The method that is used for making the correspondences between images is called the parallax theory. "Stereo parallax is a physical condition that refers to the apparent displacement of a (height) point in an image caused by a shift in the position of observation."[465] It is obtained from two images of the same object that were taken with some overlap and from an equal distance from the object. The parallax can also be defined as a difference in the coordinates of the left and right images, resulting in two components: Px and Py. The first one corresponds to the difference in elevation, while the second one to the difference in depth. The latter should be removed for stereoscopic vision to be established.
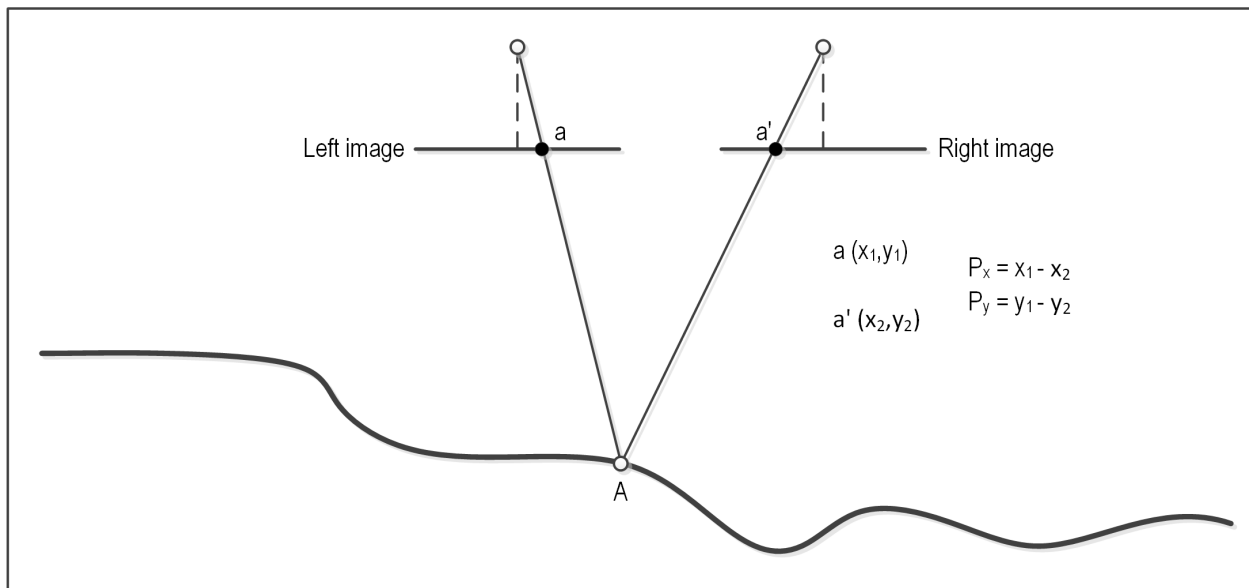

38 The parallax of the image pair

---

[464] Ibidem, p. 290
[465] Ibidem, p. 291

"The determination of 3D point coordinates is achieved by searching corresponding points along the respective epipolar lines."[466] The epipolar lines in an image, are derived from the 3D rays and form the edges of the epipolar plane. The 3D rays are the result of the photogrammetric geometry of the collinearity equation. This equation helps determine the ground coordinates from the image coordinates by equating the vectors of the camera and the real object in space. It is based on 6 external orientation parameters that fully define "the position of the camera (or the bundle of rays) and its orientation in 3D space."[467] When the vectors are correlated, a 3D ray is obtained. Intercepting the 2 rays, an image pair is made that is regulated by the epipolar plane. It is determined through the coplanarity condition that is "the analytical expression of the relative orientation."[468] The relative orientation is the establishment of the relationship between two images as they were at the time of their making. This allows determinating the homologue rays
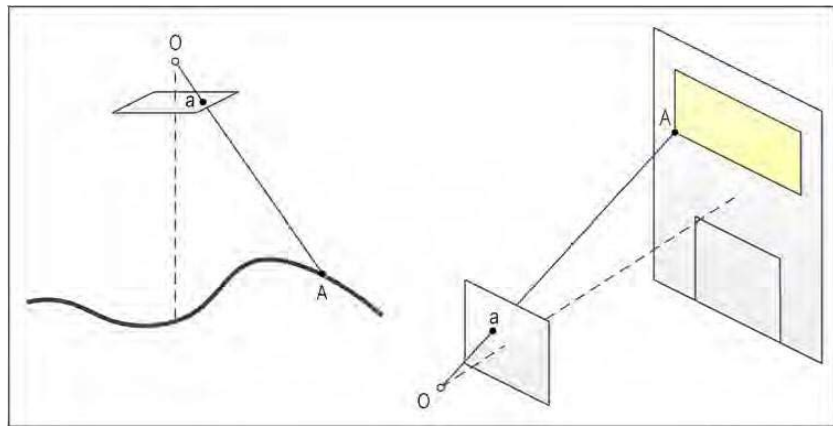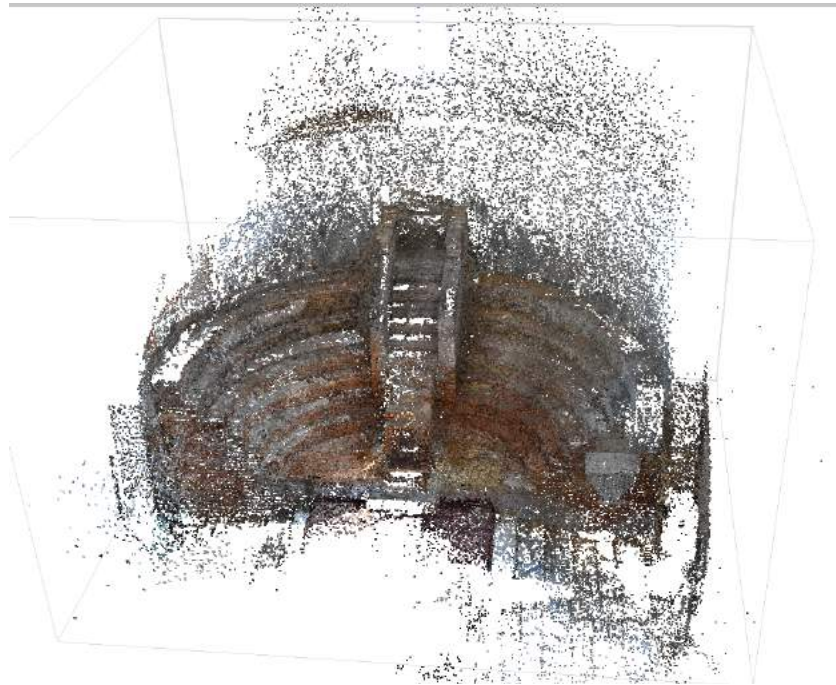

39 Collinearity condition
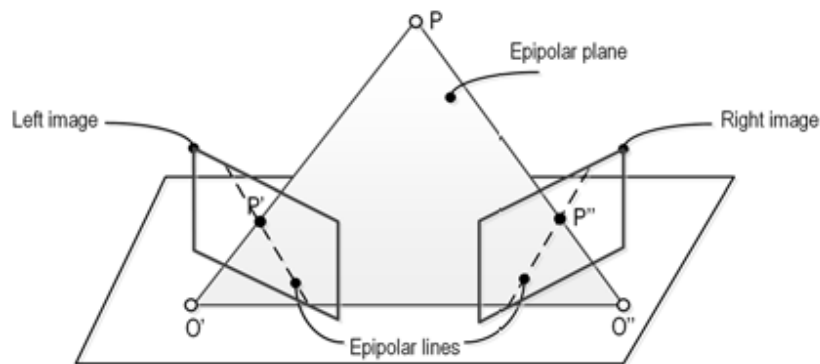
40 Epipolar plane and epipolar lines

[466] Ibidem, p. 291
[467] Ibidem, p. 277
[468] Ibidem, p. 282

that intersect at the point of the object. "The intersection of the two corresponding 3D rays will give the 3D coordinates of the points."[469] As a result, a point cloud is made.

41 A point cloud model

The next step is making the surface model from the dense cloud. There are two main ways to make one: the triangular irregular networks (TIN) and the regular grid (GRID). Agisoft Metashape software uses the first one. It recreates the surface of the object by using non-overlapping triangles that are formed based on neighboring points with different elevations.[470] Since the results can be numerous, a special set of criteria was adopted – the Delaunay triangulation. The triangles must not overlap, the sum of the sides tends to be minimum, they should not contain any neighboring point, and they tend to be equilateral in shape.[471]

The image data sets and the 3D points are used to create the DSM/DTM. These are surface models that are generated from "a set of points with known planimetric position (*X, Y*) and elevation (*Z*), and the use of a mathematical function."[472] The latter is called the digital terrain model and is produced when the elevation data is reduced to the ground. The former is short for the digital surface model that goes from the ground to the highest elevation of each point.
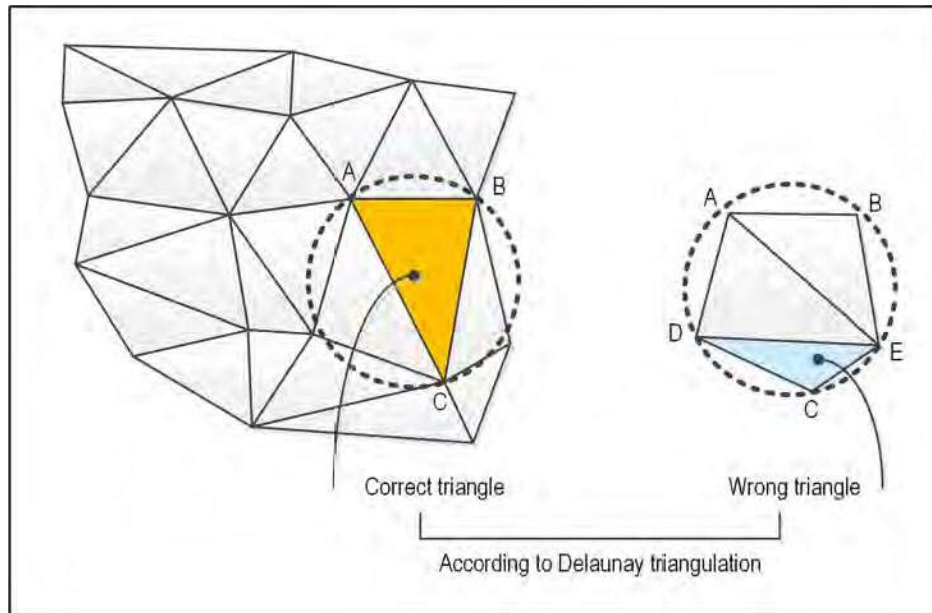
---

[469] Ibidem, p. 291
[470] Ibidem, p. 292
[471] Ibidem, p. 293
[472] Ibidem, p. 292

44 Delaunay triangulation (left: correct; right: wrong)

45 A wireframe model with visible triangulation

Regarding the models that I made, the number of photographs that were used, as well as their quality, heavily determined the outcome. In the case of the outer apse of the crypt, only 20 cameras were used. As a result, a very hollow model was obtained. It needed a lot of cleaning, and now, it consists of three separate parts. A significantly better case is the west portal of the front façade with 36 cameras. The model turned out mostly fine, except for the upper parts. There, the lack of photographs is evident in the "thorny" appearance. Using the "free-selection tool", I

126

managed to clean the model a bit. The four altars inside the church have the most photos. In that case, I took the photos myself. The number of photos is presented as follows: the altar with the bishop statue 115, the altar with the "Massacre of the Innocents" painting 99, the altar with the painting by Tintoretto's workshop 80, and the altar with the three wooden saints 97. In all 6 cases, the photos were added, aligned, dense cloud, mesh, and then the texture was built. Regardless of the number of photos in the last 4 cases, the process of producing the models was simple.

42 Upper left: the model of the outer smaller crypt apse; Upper right: norther portal; below: the 4 altars from the side naves

A more complicated case was that of the two angel sculptures from the baroque altar in the diaconicon chapel. The photos were not taken by me, and the quality of some of them was very low as they were completely blurry. These posed a bit of a problem for the software, as they remained unaligned and had to be removed. However, what made the overall process more

complex than the previous ones, was the usage and manipulation of the chunks. Since the object had to be photographed fully, the person took picture of the upper parts, turned it around, and took photos of the lower parts. In the case of the first angel, chunk number 1 has 49 photos, while chunk number 2 has 41. When the dense clouds were made, the two models needed to be merged. The software has the option of merging them on its own. However, this failed to make a right overlap of the chunk models, meaning that it had to be done manually. I did it by adding markers in precisely chosen points that exist in both models. The option of merging was done using the markers instead and resulted in a correct model. The same process was repeated in the case of the second angel. The first chunk used 30 cameras, while the second one only 25. The resulting models are blurred either because of the lack or because of the blurriness of the starting photos.

43 Two sculptures of angels from the Baroque altar. The corresponding backsides are reused parts of the crypt's pergola

The most complex models were those of the synthronon and the main apse. The former required three chunks to be made. The first has 166 cameras, the second 179, while the third one has 204, resulting in a total of 549 cameras. The tool that proved to be precious in saving time is the batch process that allows for the computation of the chunks simultaneously, resulting in more efficient time management. Once again I had to use the merging based on the markers because the software itself could not perform it. One thing that posed a bit of a problem in the final appearance was that the images were taken in two different lighting conditions. Hence, certain parts of the

model have slightly more sunlight than the rest. However, in the final model this was eliminated with the lighting option.

44 The 3D model of the synthronon

45 Left: the part of the diaconicon with the Annunciation fresco; Right: the part of the diaconicon with the fresco of St Martin

The final model that was made was that of the frescoes in the diaconicon. It consists of two chunks, one for each of the scenes. The St Martin one has 75 cameras, while the Annunciation one has 66. Both are done in high quality.

The major downside of this software is that everything needs to be clearly planned in advance. Projects themselves cannot be merged, and hence, if one wants to make an object that consists of various parts, all the chunks need to be in the same project from the beginning. Otherwise, the process will have to be repeated from the beginning which is very time-consuming. Another downside of the software is its ability to merge chunks on its own, as mentioned earlier, but also the marker recognition. When a marker is added to a photo, the placement of it in other photos in which it is visible is often totally off the point. As a consequence, it needs to be manually adjusted, resulting in a rather boring and time-consuming process. The quality of the photos affects this to a certain extent. The better they are, the better will be the location of the added markers.

When it comes to cultural heritage conservation and presentation, the models can be used for several purposes. "With support for oblique imagery processing, Metashape allows reconstructing the whole building, which can be employed for virtual tours creation, with reconstruction results being exhibited as illustrative models of largescale cultural heritage objects. 3D models of partially ruined monuments and artifacts generated with Metashape present a reliable basis for restoration works thanks to the exceptional accuracy of reconstruction results."[473] In the case of the restoration proposal for the main apse of Santa Maria Assunta, a detailed 3D of the remaining fresco fragments can be made and given to researchers upon request. Especially if the marble slabs are returned and frescoes are covered. The next possible application can be the making of the VR model, using the 3D model of the apse after the conservation intervention as a starting point. As for the pergola in the crypt and the diaconicon frescoes, it too can be recreated using Agisoft Metashape. If enough photos are made of satisfactory quality, as a result, a detailed model can be produced and used for 3D printing. The same can be done as in the above-mentioned Vasari project. If the frescoes remain in their original place, this software can be used for monitoring their condition and degradation. It can also be used to digitally restore them. " To achieve restoration, the basic steps are (i) identify the destroyed parts, (ii) interact with the 3D model and extract the geometry of the parts to be restored, (iii) insert these virtually into the 3D model, and (iv) assess the result, before the final decision."[474]

---

[473] Metashape, Intelligent photogrammetry, AgiSoftLLC, St Petersburg, 2021. https://www.agisoft.com/ [12. 2. 2022] p. 12

[474] E. Stylianidis, A. Georgopoulos and F. Remondino, op. cit. p. 299

Appendix II: Questionnaire

Teamwork is one of the most important parts of the conservation process. Every decision that is made should be made in accordance with the ethical principles and after a discussion with other professionals. Since my Master's thesis is written solely by me, the idea is to identify the stakeholders and obtain their opinions. The best suitable way for this, aside from conducting the interviews personally, is in the form of a questionnaire. In the second appendix, the questions that would be used to obtain professional opinions are presented in the order that would be in the Google form:

Introduction: The aim of this questionnaire is to help gather opinions and data regarding the restoration problems and solutions of the basilica of Santa Maria Assunta in Torcello. The results will be used in the project of my Master's thesis.

The basilica is the main architectural monument in the northern part of the Venetian lagoon. It dates from the 7th century but has been enlarged and refurbished many times during its long history. These additions in the later periods, as well as floods and other impacts, have left a mark on the church, and are the source of several conservation issues. In the questions below, there are four parts, of which the first one is general, while the other three are related to three specific restoration problems that will be discussed in my thesis. The first problem is the main apse with its two-layered decoration; the second is the altar and the ceiling in the crypt; the third one is the newly discovered frescoes that are inaccessible. The possible answers are given in the brackets after the questions. The whole questionnaire consists of 4 sections. Some of the questions will be followed by photographs or 3D models to illustrate the problem.

Section 1 (General questions):

1. What is your role or your link with the basilica of Santa Maria Assunta? (A restorer, an architect, an archaeologist, a historian or an art historian, ministry staff, etc.)
2. Do you think that the public is interested in the restoration? (Yes/No)
3. How much do you think the public knows/understands the process of restoration? (1 – does not know anything/ 10 – knows a lot)

4. Digital restoration is considered a new and very popular tool to study and present cultural heritage, as it allows for potential reconstructions to be made which serve both the professional and the public aspect of both material and immaterial heritage. In that sense, would you open for its use in the case of the basilica in Torcello, as a means of depicting parts of it that no longer exist or are inaccessible to the public? (Yes/No)

5. Which media would you use to present the past to the public? (Information panels inside the church/3D models of the previous appearance of the church/a flat screen that shows the reconstruction/augmented reality/virtual reality/other)

6. If you selected "other," could you please specify which one?

Section 2 (Restoration of the main apse): In the restoration in the 1920s, some marble slabs in the main apse were removed and a fresco layer was discovered. In the recent period, all the slabs have been taken off, showing fragments of a painted series of bishops that was part of the former fresco decoration. In the 11th century, the mosaic with the marble slabs was put over them.

1. On a scale from 1 to 10, how much would you recommend the use of digital restoration/reconstruction to illustrate the new discoveries in the main apse prior to the mosaic decoration? (1 – would not recommend/10 – would highly recommend)

2. Regarding the multilayered decoration of the apse in the church, which of the following would you rather preserve: Mosaic with all the marble slabs put back/Mosaic with all the fresco fragments visible/Mosaic with the marble slabs partially returned to reveal also parts of the fresco fragments.

3. Why did you choose that option? Please elaborate

4. Do you think that a digital copy that could be easily accessible via a screen would be a good solution to the problem of communicating the historical narrative of the internal space? (Yes/No)

5. If yes, which of these would, in your opinion be the best solution? (A QR code that, when scanned shows the reconstruction on the phone/A virtual reality headset/An installed screen that shows the reconstruction/Photographs and images on panels)

6. The "Throne of Attila" has stood in front of the basilica for a long time and became one of the main symbols of Torcello. There are reasons to believe that it was the throne of

the bishop that stood in the main apse. Would you place it back in the apse and substitute the one outside with a copy? (Yes/No)

7. Why?

Section 3 (Restoration of the Crypt): The 9th-century crypt had a marble altar (screen) that in the later period was dismantled. Its parts were used for other religious objects in the church which are of lesser importance. Some other parts of the altarpiece are missing.

1. Would you support the idea of putting it back together? (Below is the hypothetical reconstruction) (Yes/No)

2. Why?

3. If not, would you put a copy? (Yes/No)

4. We know that the ceiling was painted with a fresco of the sky and stars. Which of the three options do you think is the best for the presentation of the crypt? (No intervention: Leave the ceiling and the walls as they are/Use a light projection system to visually recreate what the crypt possibly looked like/Repaint the ceiling with a new fresco showing the sky and stars)

Section 4 (Frescoes in the Diaconicon): In a recent intervention on the roof above the southern apse (the diaconicon) new fresco fragments have been uncovered. The position is on the wall between the roof and the ceiling of the diaconicon, making them completely inaccessible. They are dated to the 9th century and are in very bad condition. The fragments show, on one side St Martin, on the other possibly a scene of Annunciation.

1. Would you remove the original fragments and exhibit them in a museum? (Yes/No)

2. Why?

3. Sometimes, a copy positioned in the "right place" can be more useful for educating the public than the original which no one can see. Do you think that a 1:1 ratio copy could serve as a good didactic tool since the fresco is inaccessible? (Red: the fresco fragments; Yellow: the mosaic vault of the diaconicon) (Yes/No)

4. Why?

Appendix III: Photo Gallery

The third and final appendix is dedicated to visual supporting material with the idea to illustrate the conservation problems of the church that have not been supported by pictures in the main part of the thesis. For each of the four sections (1. Architectural development; 2. Main apse; 3. Crypt; 4. Diaconicon) a set of visual materials has been selected. The aim is to make the problem visually clear in addition to the text from the chapter titled "Restoration Proposals."
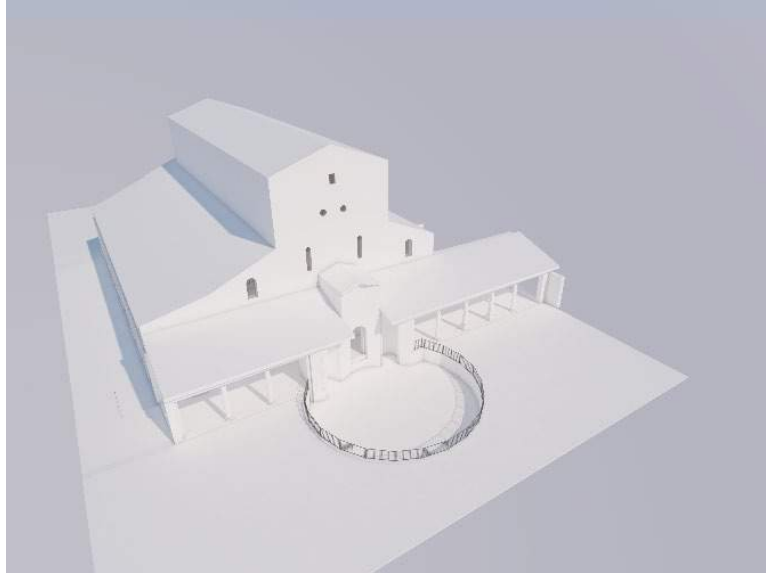
Section 1: Architectural Development
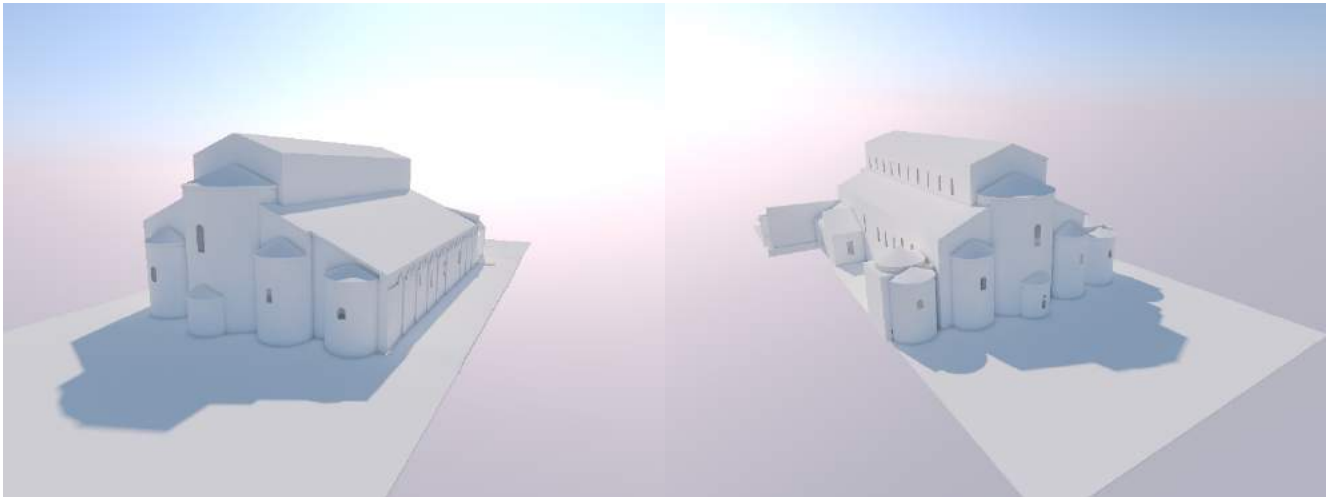
46 Left: The backside of the basilica today; Right: the backside of the basilica in the 11th century

47 The reconstruction of the front facade in the 9th century

48 The reconstruction of the front facade in the 11th century

49 The model of the today's appearance of the church

Section 2: The Main Apse
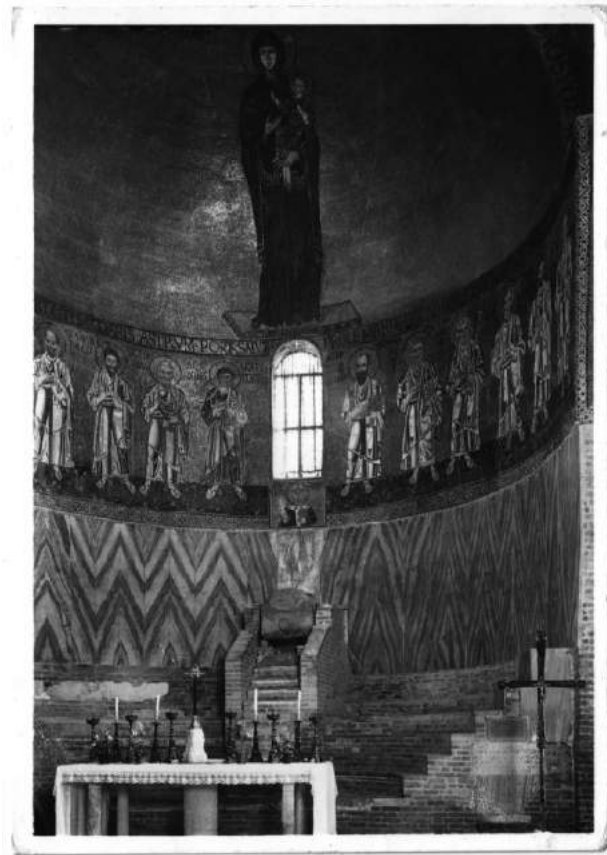
50 The throne of Attila inside the synthronon

51 The view of the fresco fragments with the mosaic above them

135

Section 3: The Crypt

52 Cross-section of the crypt in the 11th century

53 Fragments of the pergola
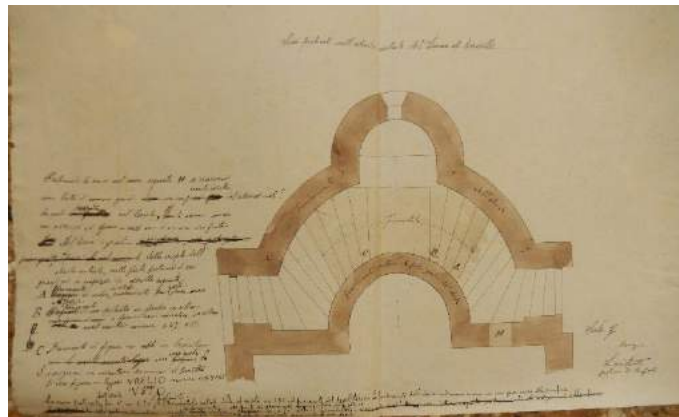
54 19th-century drawing of the plan of the crypt

55 The inner wall of the crypt dated to the 7th century structure

Section 4: The Diaconicon Murals

56 A 3D model of the upper part of the diaconicon vault
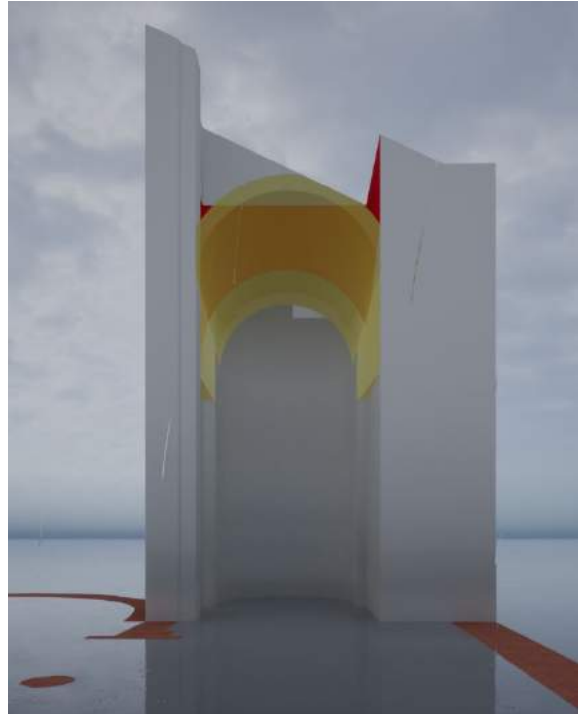

57 The location of the newly-discovered murals (red) and the diaconicon mosaic (yellow)

58 Assessment of the Annunciation mural

Conclusion

Using contemporary technology to solve conservation issues related to cultural heritage became a popular trend. This is understandable given its potential to record, alter, present, and allow for a one-of-a-kind experience to the user. However, new technologies such as VR or AR need to be used cautiously and need to be justified. Before applying them to a heritage issue, whether in an archaeological site or a single object in a museum, one needs to ask if it is necessary to use it, and what are its benefits? These answers depend from case to case because the idea and the context in which they will be applied justify the solution. Indeed, anything is possible given the right intentions.

Regarding proposals for the basilica of Santa Maria Assunta in Torcello, virtual restoration and reconstruction have a primarily didactic role that aims to educate the visitors through a visually presented narrative. In the case of the apse, the usage of VR tends to allow the visitor to peak in the 11th-century service and experience the full potential of the art, tied to the religious concept, music, and light. Here, the concept of virtual reconstruction is employed. As for the architectural development of the church, it is shown in the adjacent room of the basilica through flatscreens or information panels. The "revealing flashlight" technology can be used to visually recreate the missing pergola in the crypt. This is the best possible application of virtual restoration. The decoration of the vault is also added through the use of light that projects a possible reconstruction. All of this is aimed at increasing the readability of the crypt and enhancing its functionality.

A completely separate problem is that of the diaconicon murals that remain inaccessible to the observers, both expert and non-expert ones. The solution is not strictly digital, although using certain digital techniques can be of great use. However, the problem is primarily museological.

Further research needs to be done before any of these proposals can be considered seriously. The next step would be to perform a questionnaire and gather the opinions of previously chosen stakeholders, as can be seen in Appendix II. These should be restorers, architects, historians, archaeologists, representatives of the church, representatives of the tourist agencies, locals, etc. All of them should be presented with the problems, possible solutions; their opinions should be gathered and a final decision is to be made based on the resulting data. Only then could

these ideas become valid. The following step could also be to make preparatory digital models that will illustrate restoration/reconstruction ideas in more clear and articulate ways. This would, however, require obtaining skills in various softwares for image and 3D model manipulation.

While writing my Master's thesis and my proposals, I tried to clearly argue all of the solutions supporting them with arguments from restoration theory and practice, as well as from the theory of media and museology. The biggest contribution or rather originality of this thesis lies in its mediatory role between theory and practice. The aim was to create something that will present a crucial and necessary step before venturing into the virtual domain. So far, most of the scientific papers regarding the usage of digital technologies in the field of cultural heritage are either oriented towards practical solutions and applications, computer science and software usage, or related fields that have an impact on digital applications such as pedagogy, sociology, or theory/philosophy of media. Therefore, this thesis was structured with the purpose to bridge the gap between theory and practice, and to implement a crucial step in the conservation process. Before going into proposals, it was needed to understand the theory of restoration and its connection to museology and exhibition practices, as well as the theory of media and the history of art. All four play an immensely important role in formulating the proposals and trying to predict their outcomes. It is utterly useless to waste resources on digital technologies if all the possible solutions have not been analyzed before. Digital technologies are the counterpart of the physical object and only when viewed/understood as such, can be adequately applied in the conservation of cultural heritage. Therefore, it is mandatory to analyze them as a consequence of the practical restoration activities. This is what I tried to argue for in my Master's thesis. Naturally, this process would require a team of experts from each of the mentioned fields that would, in more detail, try to predict the outcomes and calculate the best possible activity, both in the practical and the virtual domain.

To conclude, solving any problem related to the conservation and presentation of cultural heritage is a multidisciplinary task that requires the participation of several team members with various academic backgrounds. Only then can the resulting project and its solutions gain full validity from which the heritage and the stakeholders can truly benefit. Using virtual technologies is just one of many possibilities to solve a problem. They need to be taken seriously, otherwise they can make more harm than good. Therefore, before any practical intervention is done, all the possible options need to be taken into account and their impact carefully calculated.

Bibliography

1. Agazzi, Michela. "Corsi e ricorsi della storia dell'arte. Gli altari di Torcello e Murano dal Medioevo al Barocco e ritorno." In *La Cultura del Restauro: Modelli di recezione per la museologia e la storia dell'arte,* ed. M.B. Failla, S.A. Meyer, C. Piva and S. Ventra, Campisano Editore, Rome, 2013. pp. 205-221.

2. Agazzi, Michela. Torcello Medieovale, Scultura e Architectura. *Hortus Artium Medievalium Journal of the International Research Center for Late Antiquity and Middle Ages,* 20/2, 2014. pp. 817-829.

3. Andreescu-Treadgold, Irina. "A Ninth-Century Chapel in the Basilica's Crypt at Torcello." In *Per l'Arte da Venezia all'Europa, Studi in Onore di Giuseppe Maria Pilo,* ARTE, Edizioni della Laguna, Venice, 2001. pp. 55-66.

4. Andreescu-Treadgold, Irina. "The Mosaics of Venice and Venetian Lagoon: Thirty-Five Years of Research at Torcello." In: *Arte Medievale,* Sapienza Universita di Roma, Rome, 2013. pp. 193-207.

5. Асунто, Розарио. *Тоерија о Лепом у Средњем Веку*, прев. Г. Ерњаковић, Српска Књижевна Задруга, Београд, 1975.

6. Benjamin, Valter. "Umetničko Delo u Veku Svoje Tehničke Reprodukcije," u: *Studije Kulture,* ur. J. Ђorђević, Službeni Glasnik, Beograd, 2008.

7. Boniface, Priscilla. *Managing Quality Cultural Tourism,* Routledge, New York, 2003.

8. Bošnjak, Branko. *Filozofija od Aristotela do Renesanse i Odabrani Tekstovi Filozofa,* ur. V. Filipović, Matica Hrvatska, Zagreb, 1957.

9. Бранди, Чезаре. *Теорија Рестаурације,* ур. и прев. Б. Шекарић, Италијанска кооперација, Београд, 2007.

10. Broeckmann, Andreas. "Image, Process, Performance, Machine: Aspects of an Aesthetics of the Machinic." In: *MediaArtHistories,* ed. O. Grau, MIT Press, Massachusetts, 2007. pp. 193-207.

11. Calaon, Diego. Ecologia della Venetia prima di Venezia: Uomini, Acqua e Archeologia. *Hortus Artium Medievalium Journal of the International Research Center for Late Antiquity and Middle Ages,* 20/2, 2014. pp. 804-817.

12. Calaon, Diego. *Quando Torcello era abitata,* Regione del Veneto, Venice, 2013.

13.   Calaon, Diego, Zendri, Elisabetta and Biscontin Giulio. *Torcello Scavata. Patrimonio Condiviso,* Regione del Veneto, Venice, 2014.

14.   Calaon, Diego and Bergamo, Martina. 2020, TORSMA2020, Manuscript in preparation

15.   Cameron, Fiona. Beyond the Cult of the Replicant – Museums and Historical Digital Objects: Traditional Concerns, New Discourses, in: *Theorizing Digital Cultural Heritage,* ed. F. Cameron and S. Kenderdine, MIT Press, Massachusetts, 2007. pp. 49-77.

16.   Cassiodorus, *Variae,* trans. S.J.B. Barnish, Liverpool University Press, Liverpool, 2006.

17.   Crouzet-Pavan, Elisabeth. Venice and Torcello: History and Oblivion. *Renaissance Studies,* Vol. 8, No. 4, 1994. pp. 416-427.

18.   Cubitt, Sean. Projection: Vanishing and Becoming, in: *MediaArtHistories,* ed. O. Grau, MIT Press, Massachusetts, 2007. pp. 407-423.

19.   De Rubeis, Flavia. "L'Iscrizione del 639 di Santa Maria Assunta di Torcello tra Miti e Realta." In *Lezioni Marciane 2017-2018, Venezia prima di Venezia, Torcello e dintorni,* ed. M. Bassani, M. Molin and F. Veronese, "L'Erma" di Bertschneider, Rome, 2020. pp. 101-109.

20.   Deloš, Bernar. *Virtuelni Muzej,* prev. V. Pavlović, Clio, Beograd, 2006.

21.   Demas, Martha. „Planning for Conservation and Management of Archaeological Sites: A Values-Based Approach." In *Management Planning for Archaeological Sites: An International Workshop Organized by the Getty Conservation Institute and Loyola Marymount University, 19th-22nd May 2000,* ed. Jeanne Marie Teutonico and Gaetano Palumbo (Los Angeles: Getty Conservation Institute, 2000), pp. 27-50.

22.   Dennis, LM. 2020. Digital Archaeological Ethics: Successes and Failures in Disciplinary Attention. *Journal of Computer Applications in Archaeology*, 3(1), pp. 210–218. DOI: https://doi.org/10.5334/jcaa.24

23.   Dibi, Žorž. *Umetnost i društvo u Srednjem veku,* trans. S. Marjanović-Dušanić, Clio, Belgrade, 2001.

24.   D'Onofrio, Mario. "Medieval Architecture," in: *Rome the golden centuries*, ed. M. Bussagli, h.f.ullmann, Potsdam, 2013. pp. 170-206.

25.   Đokić, Radoslav. *Istorija estetike II,* Službeni glasnik, Beograd, 2008.

26.   Đokić, Radoslav. *Istorija estetike III*, Službeni glasnik, Beograd, 2012.

27.   Economou, Maria and Pujol Tost, Laia. "Educational Tool or Expensive Toy? Evaluating VR Evaluation and its Relevance for Virtual Heritage" in *New Heritage: New Media and Cultural Heritage,* ed. Y.E. Kalay, T. Kvan, and J. Affleck, Routledge, New York, 2008. pp. 242-261.

28.   Fabbri, Luca. "La cripta di Santa Maria Assunta a Torcello: il richiamo a Bisanzio all'interno della politica di legittimazione orseoliana," in: *Citazioni, modelli e tipologie nella produzione dell'opera d'arte. Atti delle Giornate di studio. Padova 29-30 maggio 2008,* 2011. pp. 3-10.

29.   Flynn, Bernadette. "The Morphology of Space in Virtual Heritage." In: *Theorizing Digital Cultural Heritage,* ed. F. Cameron and S. Kenderdine, MIT Press, Massachusetts, 2007. pp. 349-369.

30.   Fouseki, Kalliopi and Sandes, Caroline. "Private Preservation versus Public Presentation: The Conservation for Display of In Situ Fragmentary Archaeological Remains in London and Athens" in *Papers from the Institute of Archaeology 19* (2009): pp. 37-54.

31.   Gasparri, Stefano. "The First Dukes and the Origins of Venice." In *The Medieval Mediterranean: Peoples, Economies and Cultures, 400-1500,* ed. S. Gelichi and S. Gasparri, Brill, Leiden, 2018. pp. 5-27.

32.   Gasparri, Stefano. "The formation of an early medieval community: Venice between provincial and urban identity." In *Three empires, three cities: identity, material culture and legitimacy in Venice, Ravenna and Rome, 750-1000, An International Workshop organized by All Souls College of University of Oxford, 20-22 March, 2014.* ed. V. West-Harling, Brepols, Turnhout, 2015. pp. 35-51.

33.   Gilbert, Katarina Everet i Kun, Helmut. *Istorija estetike,* transl. D. Puhalo, Kultura, Beograd, 1969.

34.   Grau, Oliver. *Virtual Art: From Illusion to Immersion,* trans. G. Custance, MIT Press, London, 2003.

35.   Iozzia, Daniele. *Aesthetic Themes in Pagan and Christian Neoplatonism: From Plotinus to Gregory of Nyssa.* Bloomsbury, London, 2015.

36.   Kluckert, Ehrenfried. "Romanesque painting." In *Romanesque,* ed. R. Toman, transl. F. Hulse, h.f.ullmann, Potsdam, 2015, pp. 382-462.

37. Liestol, Gunnar and Hadjidaki, Elpida. "Quasi-Mixed Reality in Digital Cultural Heritage: Combining 3D Reconstructions with Real Structures on Location – The Case of Ancient Phalasarna." In *Digital Cultural Heritage,* ed. H. Kremers, Springer, Cham, 2020. pp. 423-433.

38. Manovič, Lev. *Metamediji,* Centar za savremenu umetnost, Beograd, 2001.

39. Manovič, Lev. *Jezik Novih Medija,* Clio, Beograd, 2015.

40. Maroević, Ivo. *Uvod u Muzeologiju,* Zavod za informacijske studije Odsjeka za informacijske znanosti Filozofskog fakulteta Sveučilišta u Zagrebu, Zagreb, 1993.

41. Niero, Antonio. *Die Basilika von Torcello und Santa Fosca,* Ardo/Edizioni d'Arte, Venezia, 1963.

42. Panofsky, Erwin. *Perspective as symbolic form*, New York: Zone Books, 1991.

43. Pietroni, E.; Ferdani, D. Virtual Restoration and Virtual Reconstruction in Cultural Heritage: Terminology, Methodologies, Visual Representation Techniques, and Cognitive Models. *Information 2021*, 12, 167. https://doi.org/10.3390/info12040167

44. Plotin. *Eneade,* urednik V. Marković, IRO „Grafos", Beograd, 1982.

45. Popadić, Milan. *Diskretni šum peščanika: baština i njene nauke,* ur. Dr N. Krstović, Centar za muzeologiju iheritologiju Filozofskog fakulteta Univerziteta u Beogradu, Beograd, 2021.

46. Popadić, Milan. *Čiji je Mikelandjelov David? Baština u Svakodnevnom Životu,* ur. D. Bulatović, Centar za muzeologiju i heritologiju Filozofskog fakulteta Univerziteta u Beogradu, Beograd, 2012.

47. Poulios, Ioannis. "Discussing strategy in heritage conservation: Living heritage approach as an example of strategic innovation", *Journal of Cultural Heritage Management and Sustainable Development* Vol. 4 No. 1, 2014 pp. 16-34.

48. Renfrew, Colin and Bahn, Paul. *Archaeology,* Thames&Hudson, London, 2016.

49. Rizzardi, Clementina. "La Decorazione Musiva: Torcello e la Cultura Artistica Mediobizantina," in: Torcello alle Origini di Venezia tra Occidente e Oriente, ed. G. Caputo and G. Gentili, Marsilio, Venice, 2009. pp. 60-85.

50. Santana Quintero, Mario and Eppich, Rand. Intorduction – Current Trends in Cultural Heritage and Documentation, in: *3D Recording, Documentation and Management of*

Cultural Heritage, ed. E. Stylianidis and F. Remondino, Whittles Publishing, Dunbeath, 2016. pp. 1-15.

51.   Schutz, Herbert. *The Carolingians in Central Europe, Their History, Arts and Architecture: A Cultural History of Central Europe, 750-900,* Brill, Leiden, 2004.

52.   Silver, Minna. "Conservation Techniques in Cultural Heritage." In *3D Recording, Documentation and Management of Cultural Heritage,* ed. E. Stylianidis and F. Remondino, Whittles Publishing, Dunbeath, 2016. pp. 15-107.

53.   Stylianidis, Efstratios, Georgopoulos, Andrea and Remondino, Fabio. "Basics of Image-Based Modelling Techniques in Cultural Heritage 3D Recording." In *3D Recording, Documentation and Management of Cultural Heritage,* ed. E. Stylianidis and F. Remondino, Whittles Publishing, Dunbeath, 2016. pp. 253-353.

54.   Špikić, Marko. *Konzerviranje europskih spomenika od 1800. do 1850. godine,* Leykam international, d.o.o., Zagreb, 2009.

55.   Thwaites, Harold. "Digital Heritage: What Happens When We Digitize Everything?" In *Visual Heritage in the Digital Age,* ed. E. Ch'ng, V. Gaffney and H. Chapman, Springer, London, 2013. pp. 327-349.

56.   Toman, Rolf. Introduction, in: *Romanesque.* transl. F. Hulse, h.f.ullmann, Potsdam, 2015, pp. 7-20.

57.   Trevisan, Gianpaolo. "Il rinnovamento architettonico degli edifice religiosi a Torcello, Aquileia e Venezia nella prima meta del secolo XI," in: *La reliquia del Sangue di Cristo: Mantova, l'Italia e l'Europa al tempo di Leone IX, Atti del Convegno internazionale (Mantova, 23-26 novembre 2011),* ed. G. Cantarella and A. Calzona, Scripta, Verona, 2012. pp. 479-504.

58.   Tsivolas, Theodosios. *Law and Religious Cultural Heritage in Europe.* Springer, London, 2014.

59.   Quinlan-McGrath, Mary. *Influences: Art, Optics, and Astrology in the Italian Renaissance*. Chicago: The University of Chicago Press, 2013.

60.   Vecchi, Maurizia. *Chiese e Monasteri Medioevali Scomparsi della Laguna Superiore di Venezia,* L'Erma di Bretschneider, Rome, 1977.

61.   Vecchi, Maurizia. *Torcello Nuove Ricerche,* L'Erma di Bretschneider, Rome, 1982.

62.   Vecchi, Maurizia. *Torcello Ricerche e Contributi,* L'Erma di Bretschneider, Rome, 1979.

63. Watterson, A. "Beyond Digital Dwelling: Re-thinking Interpretive Visualization in Archaeology", *Open Archaeology,* 2015; 1: 119-130 DOI 10.1515/opar-2015-0006

64. West-Harling, Veronica. Introduction, in: *Three empires, three cities: identity, material culture and legitimacy in Venice, Ravenna and Rome, 750-1000, An International Workshop organized by All Souls College of University of Oxford, 20-22 March, 2014.* ed. V. West-Harling, Brepols, Turnhout, 2015. pp. 13-33.

65. Wingfield, Kim Butler. "Networks of Knowledge: Inventing Theology in the Stanza della Segnatura", *Studies in Iconography*, Princeton University Press, Vol. 38, 2017, pp. 174-221.

66. Witcomb, Andrea. "The Materiality of Virtual Technologies: A New Approach to Thinking about the Impact of Multimedia in Museums." In: *Theorizing Digital Cultural Heritage,* ed. by F. Cameron and S. Kenderdine, MIT Press, Massachusetts, 2007. pp. 35-49.

67. Zanetto, Serena. *Tradizione Costruttive nell'alto e medio Adriatico (secoli VII-XI): Eredita e innovazione nell'alto Medioevo,* All'Insegna del Giglio, Sesto Fiorentino, 2017.

68. Metashape, Intelligent photogrammetry, AgiSoftLLC, St Petersburg, 2021. https://www.agisoft.com/ [12. 2. 2022]

69. https://www.historywalksvenice.com/2020/07/new-frescoes-in-the-torcellobasilica/#:~:text=The%20'new'%20frescos%20are%20from,ceiling%20was%20full%20of%20debris. [10. 2. 2022]