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The 3D reconstruction model of the Roman theatre of Falerio Picenus (Falerone, Italy): promoting cultural heritage, understanding our past.

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Abstract

Falerio Picenus (now Piane di Falerone) was a rather important town in Antiquity, as we can presume from the ancient sources, from the communication routes that crossed it, and from the remains of the ancient monuments still preserved. A theatre, an amphitheatre, monumental cisterns and tombs were discovered, but all of them were stripped of their decorations during Late Antiquity and Middle Ages. This paper presents a three-dimensional reconstruction of the city's theatre, based on a new survey of the structures using a long-range 3D laser scanner, combined and integrated with photogrammetry and direct survey. The model is supposed to serve not only as a show case of the original shape of the public building, but also as a real research tool.

Keywords

Falerio Picenus; 3D reconstruction; Theater; Roman Archaeology

Introduction

Falerio Picenus was an ancient city that arose on a plateau to the left of the Tenna river, in the Marche region, where today the modern village of Piane di Falerone (FM) stands, in a favourable position.¹ *Falerio Picenus* was an important stage on the ancient road that led from *Urbs Salvia* to *Asculum* and reconnected this area with the *Salaria Gallica* road (Quilici 2007; Giorgi 2000; 2021), but it was also a leg on the path that linked this valley and the Apennine with the coastal road system, following the Tenna.² The area had already been populated by the *Picentes* before the arrival of the Romans, who possibly founded a village here,³ and a steady larger centre arose in 49 BCE, and acquired monumental relevance later, when a colony of Augustinian veterans was established (Perna 2012; Tosi 2003, 331; Paci 1995). The city flourished, until in late antiquity the inhabitants were forced to take refuge in more defensible positions due to the, so-called, barbarian invasions and the Greek-Gothic war. People moved up to the hill that today is home to the modern town of Falerone (Maraldi 2002, 106-8).

¹ I would like to express my deepest gratitude to E. Giorgi and F. Grilli for having continuously stimulated this research and for their precious advice during the work.

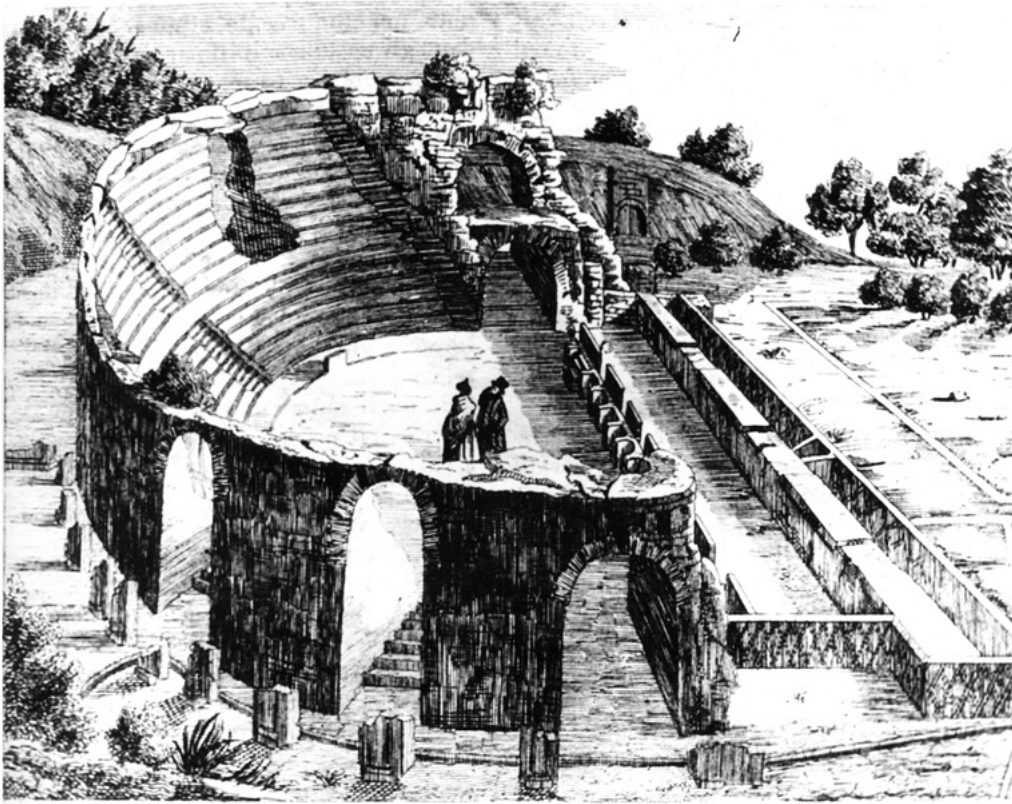
² The course of these roads is attested by six milestones that were discovered near Falerone, dating back to between 305 and 365 CE (Paci 2020, 185; Perna 2012, 383). On the evolution of the road system in late antiquity, refer to Pasquinucci *et al.* 2000 and Campagnoli, Giorgi 2006.

³ This consideration arises from the observation that the site is surrounded by villages of this culture (Grottazzolina, Montegiorgio, Belmonte Piceno, Penna San Giovanni and Fermo), rather than by archaeological elements, at the present state of knowledge. Probably here there was the population of the 'Papuni' mentioned in some epigraphs in the area, see Giorgi-Demina 2018.

The archaeological site was discovered in 1595 on the occasion of the fortuitous discovery of an inscribed bronze plate found near the theatre (CIL IX, 5420; Catani 1989, 254). It was an edict of the emperor Domitian, who in 82 CE settled a territorial dispute between the inhabitants of *Falerio Picenus* and those of *Firmum*, regarding the possession of some territories that had remained unassigned (*subseciva*) during the previous land division operations (Giorgi 2020). At the time of the discovery, the area belonged to the Church, and therefore the inscription was donated by the discoverer to Cardinal Pietro Aldobrandini, who probably carried out new archaeological research. No documentation survives of these activities, except for the tradition that in those years a lot of statues and inscriptions were discovered (Colucci 1788; Catani 1989, 254; Maraldi 2002, 9). The first documented investigations at the site took place in the eighteenth century. In 1777 Falerone and a series of other archaeological sites in the Marche region, such as *Cupra Maritima*, *Helvia Ricina*, and *Urbs Salvia* were investigated in search of 'beautiful finds' with which to enrich the rooms of the Pio Clementino Museum in Rome, one of the most important collections of the future Vatican Museums (Catani 1989, 191-196; Cingolani 2018).

These early investigations focused especially on the theatre (Catalani 1778, 27; Montali 2015, 53), which has always remained visible and was still at the time well preserved. At the eyes of the first explorers, it was a magnificent structure (Bonvicini 1971b), today difficult even to imagine, given its present state of conservation: an imposing structure, but completely deprived of its decorations, a destiny in common with many other theatres (Fuchs 2021). The amphitheatre was also partially excavated along with other areas (Catalani 1778, 27; Montali 2015, 53). After a few months, when the excavators believed that it was no longer possible to find anything important at the site, the digging was abandoned and the materials discovered were sold or brought to Rome (Catani 1989). Fortunately for us, the excavators wrote, if not actual excavation reports, at least notes, and a local notary, B. Agabiti, drew the most significant findings as they were being discovered (Bonvicini 1971b).

New research in *Falerio Picenus* was organized only in 1836 by the brothers Gaetano and Raffaele De Minicis, who bought the land where the theatre was and started digging there as well as in various other areas of the ancient town (Montali 2015). They had more noble purposes than the mere search for beautiful objects: they did it to increase our knowledge of the ancient city, 'nella certezza di vantaggio non iscarso tornerebbe l'esame di questi ruderi alla scienza archeologica, ed all'architettura' (Bonvicini 1971a) and they left us a precious diary of the excavation activities, drawn up daily by Raffaele De Minicis, as well as a beautiful representation of the structure immediately after the research (Fig. 1) and drawings of the finds (Bonvicini 1971a). Various epigraphs useful for the dating of the theatre and for the understanding the chronology of the ancient structures of Falerio were found during this research and furthermore, by investigating areas not excavated in the eighteenth century, they found various decorative elements and statues (Fig. 2. Bonvicini 1971a, 100-101). A great debt of gratitude for the study of the whole city goes to P. Bonvicini, an honorary inspector of the Superintendency, who in 1954 and 1991 was the author of the most important studies about *Falerio Picenus* and its theatre. He is also the author of a good planimetry and a reconstructive drawing of the elevation of the theatre that has been, in large part, accepted in our model. It is a work that is still useful for us, even if it has been updated by L. Maraldi in 2002, R. Perna in 2012 and by our team. In recent years, scholars focused particularly on the theatre (Paci, Montali 2011; Montali 2015), by outlining in more detail the activities of the



TEATRO DI FALERIA NEL PICENO

Figure 1. Illustration of the Falerone theatre by P. Mori after the excavations carried out by the De Minicis brothers (Campanari 1840, plate outside the text).

De Minicis brothers and a careful technical analysis of the structure. In the last few years, the collaboration between the Municipality of Falerone, and a Hungarian research group headed by Z. Ordasi and I. Váli, in collaboration with S. Cecchi produced the first three-dimensional reconstruction of the theatre (Ordasi 2016; Cecchi 2016), a work that remained unfinished.

The new research project

Between the fields and the modern rural structures of Piane di Falerone, various pieces of evidence of the ancient town can be observed: the theatre, the amphitheatre, two cisterns, the remains of a temple and some funerary monuments (Maraldi 2002). These provide but a glimpse of the importance of the city in ancient times; in fact, the lack of a recent overall study on the town, not concerning just single monuments or aspects, still prevents us from achieving a complete understanding. To address this issue, a project was instituted by the Superintendence of Archeology, Fine Arts and Landscape of the Marche Region, the University of Bologna (Department of History and Cultures) and the Municipality of

Falerone, directed by E. Giorgi, F. Grilli and P. Storchi. Our aim was not only to improve the knowledge of the city as a whole, but also to make the single structures of the ancient Roman city comprehensible to everyone, through new and updated studies for each known building, and supported by the latest technologies. The study regards monuments and their context, through the investigation of the in-between areas, undertaken through the analysis of archaeological data, epigraphy and written sources. The analysis of satellite, aerial and drone imagery making use various sensors, of geophysical surveys is ongoing and will possibly followed by archaeological excavations. To make monuments accessible to the wider public, three-dimensional computer digital reconstructions and modelling is being created and an approach that allows people to see the model directly on the site, simply by scanning a QR code with their smartphone.⁴

The principal aim of digital reconstructions is to facilitate an immediate and effective knowledge of monuments that are no longer or only partially preserved (Remondino-Campana 2014; Limoncelli 2019, 28; Viccei 2019, 85), but they could be much more than that. We have tried to create

a reconstruction of the theatre that is not only of great visual impact, but also reliable from the archaeological point of view, a model could be used as an actual study tool.⁵ In this particular case, the model enabled us to check whether the architectural elements discovered in the area could fit on the reconstructive skeleton according to their size and the general harmony of the building (Gabellone *et al.* 2017), or to test previous hypotheses (Viccei 2019, 88). As already widely demonstrated, this is a very useful practice and transforms a work of virtual archaeology into a real virtual restoration.⁶ It is the only way,



Figure 2. Marble statue of Cereres probably originally located in one of the niches of the scaenae frons of the theatre of falerio picenus, but discovered in one of the vomitoria. Antiquarium of Falerone. Courtesy of the Italian Ministry of Culture

⁴ For the importance of 3D models, see D'Andria 2017, 78-83. On the QR technology for a wider public see the case of the theatre of Taormina (Malfitana 2017).

⁵ Barcelò 2001. Some good examples of models created for study are: Verona (Tronchin-Bevilacqua 2022), Volterra (Fuchs 2021), Segesta (D'Andria 2017), Herapolis (D'Andria 2012).

⁶ Maldonado 2005; Limoncelli 2012; 2019; Forte 1997; 2004; 2007; 2014; Barcelò *et al.* 2000; Gianolio 2012; Bennardi-Furferi 2007.

in our opinion, to obtain a convincing model, while it has recently been pointed out that many reconstructions that can be seen online or in archaeological sites should be considered as approximate, if not incorrect, beyond the understandable margin of uncertainty that always remains in these kind of works.⁷

The modelling of the theatre

As M. Luni affirmed, the theatre of *Falerio Picenus*, together with the nearby structures of Ascoli, *Urbs Salvia*, *Ricina*, *Ostra*, *Pitino Mergens* and *Suasa* have been, over the centuries, almost completely robbed of their decorations and it is therefore extremely complicated to propose what they might really have looked like in antiquity (Luni 2003, 242; Voccei 2019). In the case of Falerone, however, many decorative elements were still preserved in the eighteenth century, and in the nineteenth century; we are able, therefore, to propose a 3D model based on an adequate amount of data (Gabellone 2017, Viccei 2019, 88-89).

The Falerone theatre is the smallest of the *Regio V Picenus* to date (Fig. 3) (Capodaglio-Cipolletta 1999; Luni 2003, 243; Tosi 2003). Its orchestra measures 18.60 m and the *cavea*, which opens to



Figure 3. Aerial Photograph of the theatre. Courtesy of the Italian Ministry of Culture

⁷ A problem which, as noted by R. Viccei (Viccei 2019, 84-85), perhaps derives from the fact that many working groups prefer ostentation over a philologically accurate reconstruction. See also Tronchin-Bevilacqua 2022, 184; Limoncelli 2019; Viccei 2019, 85; Gabellone *et al.* 2017.

the south east, is 49.20 m long. It has a simple architectural structure: it is a self-supporting building, with the first and second tiers of seats supported by an earth fill (*agger*) held by retaining walls, as in Urbino, Gubbio and Mevaniola (Bonvicini 1991; Ortalli 1994, 284-288; Maraldi 2002, 38; Luni 2003, 245), while the third level of the *cavea*, which has now disappeared, was supported by a vaulted gallery with brick pillars, of which only the lower portions are still partially preserved. This external arcaded façade represents a peculiarity in the theatrical architecture of ancient *Picenus* where most of the theatres, lean on natural slopes, such as the ones of Urbisaglia, Fermo and Ascoli (Tosi 2003, 337). To date, this architectural feature is known only in *Helvia Ricina* and *Interamnina*, and the Falerio theatre seems to be the most ancient of the three. Access to the structure was possible through four *vomitoria* that, from the external ambulatory, led to the *praecintio*, the horizontal corridor that divided the *cavea* into two sectors, with staircases that narrow slightly from the outside to the inside.⁸ The two main entrances, the *aditus maximi*, are preserved and on their vaults, there must have been two tribunes (*tribunalia*), perhaps accessible only from the *cavea*. Little remains of the *proscenium*, the *pulpitum* and the *scaenae frons*. In the eighteenth century the whole area was much better preserved than it is today, so for its reconstruction we can rely on these data, and on geometrical studies based on contemporary structures (Fuchs 2020, 251-2, type C).

The structure is built using different building techniques, such as brick works, *opus reticulatum*, *opus vittatum*, and seems to have been conceived in a single moment, as already proposed by G. Montali (2015, 61). Small interventions are attested by an inscription (CIL IX 5426) dating back to the age of Claudius (Fig. 4). Here the words *faciendum curavit* must probably be attributed to the monumentalising of these entrances and not related the entire theatre, as previously hypothesized. In fact, the discovery during the excavation of the western *vomitrium* of an inscription with a dedication to Gaius Cesar (CIL IX 5425), dated by C. Delplace (1996, 119; Cancrini, Delplace and Marengo 2001, 27) to the year 5 BCE or 1 CE, suggests a most antique dating for the structure, contemporary with the foundation of the colony (Montali 2015, p. 78), as stated by the great majority of scholars.⁹ This chronology seems also to be confirmed by a further epigraph (CIL IX 5449): a dedication to a certain Octavia who should probably be identified as Octavia minor, the sister of Augustus (Cogitore 2000; Marengo 2008). The construction of a theatre in this era is not surprising, since it is part of a series in the Regio V,¹⁰ and it would also fit in a much wider phenomenon that affects, at least, the entire Italian peninsula (Bejor 1979; Sommella and Migliorati 1988). Some technical details of the structure also point towards foundation in the Augustan age (Montali 2015, 79; Maraldi 2002). The majestic simplicity of its architecture, and the rectilinear stage building (Small 1983, 58-60; Maraldi 2002, 40), equipped with three doors placed on the same line and with no exedras, seems to appear in the theatre of Marcellus in Rome and then was adopted in the immediately following years in many theatres. Afterwards it gave way to more spectacular architectural structures (Fuchs 2021, 382; Pensabene-De Nuccio 2010; Sear 2006, 84-87; Tosi 2003, 331). The

⁸ Outside, the access was 2.40 wide, at its entrance into the structure 1.70 m, and it was characterized by 8 steps of 37 x 19 cm. Probably, as we will explain, one of them was decorated with an epigraph dating back to 43 CE.

⁹ Bonvicini 1954, 40; Delplace 1996, 120; Luni 2003, 249; Maraldi 2002, 39; Montali 2015. A dedication to Gaius and Lucius Caesar was also found in the Cassino theatre (Pensabene-De Nuccio 2010, 74) and in Cartagena (Ramallo Asensio 1999).

¹⁰ In this region we can list *Urbinum*, *Asculum*, *Firmum*, *Interamnina praetutonium*, *Urbs Salvia* and probably *Helvia Ricina*; in the nearby *Regio VI*, *Oriculum*, *Carsuale*, *Hispellum*, *Spoletium* and *Interamnina Nahars*. Luni (2003) writes that *Aesis*, *Ariminum*, *Bevagna* may also have been built in the Augustan age.



Figure 4. Inscription relating to an embellishment of the theatre dating back to the age of Claudius, on a slab shaped like an arch. Nineteenth-century drawing (Bonvicini 1971a, 100) and three-dimensional processing (elab. Studio111).

fact that the *scaenae frons* is almost of the same length as the *orchestra* is also considered an architectural peculiarity of this period (Small 1983, 57-60; Maraldi 2002, 40).

The first operation carried out on the field was to obtain a new topographical survey of the structure using a long-range 3D laser scanner (Fig.5), combined and integrated with photogrammetry and direct survey.¹¹ The laser-scanner provides much more precise data that are also being used to identify the restorations carried out in relatively recent years which were either not, or only poorly documented. The point clouds generated from 75 stations have become the reference digital model for the reconstruction, providing us with a solid base of data which literally grounds and supports the three-dimensional model.¹² The topographic survey was conducted by V. Castignani and F. Pizzimenti using a Laser Scanner Leica P30, a time-of-flight laser particularly suitable for the documentation of architectural contexts, and resulted in an accurate 3D model of the monument. The acquisition method involved the use of reflective target as control points for relative and reciprocal positioning of setups, in order to achieve a pre-alignment of scans at the acquisition stage and a more precise registration in post-processing. The sampling interval was selected as 6mm at 10 m, ensuring high resolution in point cloud restitution. Data processing resulted in a three-dimensional point

¹¹ A previous, high-quality survey by N. Masturzo in 2005 was used to integrate parts that are no longer visible today, since a modern wooden stage covers much of the *proscenium* and of the *scaenae frons*.

¹² This is generally considered to be the best operational protocol in 3D modeling, see Fuchs 2021, 387; Bianchini-Potestà 2018; Bilis *et al.* 2017; Mele-Maniglio 2015, Finat *et al.* 2005.

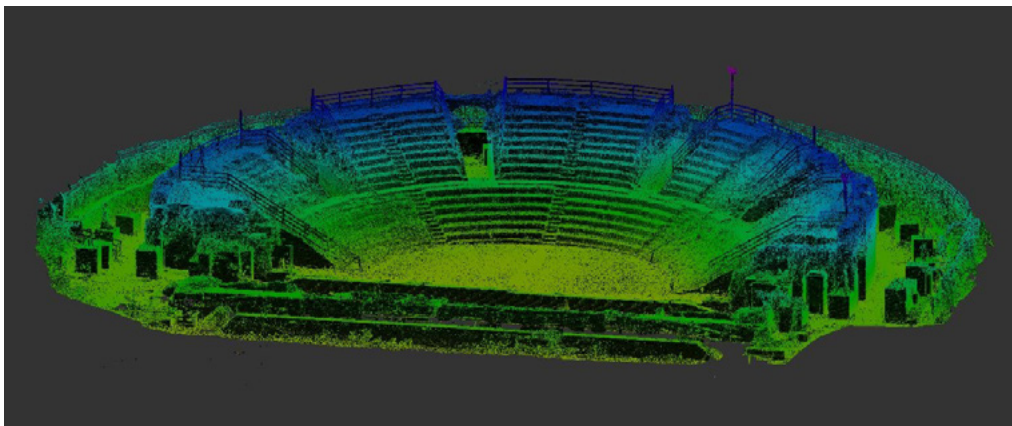


Figure 5. Laser scanner survey of the theatre in false colours (elab. V. Castignani).
Courtesy of the Italian Ministry of Culture

cloud with sub-centimetre accuracy, clean of noise and visualized through different colour map parameters.

We then proceeded with the reconstruction of the theatre, studying the problems inherent in the building section by section, as well as the aesthetic and functional connections between the parts. The modelling operation was entrusted to the company Studio 111 run by L. Tampieri and G. Canuti, who took care of the technical part of the work; they used Autodesk 3ds Max for the elevation and for the details and the texturing phase Zbrush, Adobe Photoshop and Substance painter softwares were used. Lights and peculiar characteristics of the materials were given with a GPU-based graphic engine Fstorm.

In the following paragraphs a detailed explanation of the reconstructive process is provided, in order also to make available all the useful data to open a debate and a dialogue with the scientific community regarding these fascinating, but challenging reconstructions.

The *cavea* (Fig. 6)

The easiest part for us to reconstruct was the *cavea* because it is still largely preserved. It was divided into four wedged areas by five staircases. Today only the core of *opus coementicium* and pebbles can be seen, but originally it must have been covered with stone. Analysing the notes of the De Minicis brothers (Bonvicini 197 b, 375, n. 5), it seems that the *scalaria* were covered with marble, and the seats in local travertine. It was therefore decided to colour the seats in pale yellow and the stairs in white, a very elegant chromatic difference.¹³ Wieseler (1851) is the only that indicates the presence of a double-width staircase in the centre, something that is no longer verifiable today, since this part of the theatre has been heavily restored. Yet, since this has never been underlined either in the notes of the eighteenth-century excavations or by the De Minicis brothers, it must be considered untrue. Moreover, this is a very rare

¹³ In Verona also the seats were in local white stone, while the stairs were in red marble from S. Ambrosius (Tronchin-Bevilacqua 2022, 185).



Figure 6. 3D representation of the cavea (elab Studio111).

architectural solution, so we decided to model the central staircase in the same way as the other ones.

The *ima cavea* presents a footrest and 6 steps (58 x 30 cm for the steps and 30 x 26 for the footrests), followed by a wider upper limit, the *praecintio* (75 cm wide and 10 cm high), and then by the *media cavea*, which had 1 footrest and 9 steps; the steps have the same size as those of the *ima cavea*. Very little remains of the last two rows, but we can rely on the excavation data that were confirmed by the 3D model. Nothing remains of the third level, the *summa cavea*, and likewise only little was still standing at the time of the first excavations. We suggest that it had a width of 2.46 m as indicated by the space between the external pillars and the internal ambulatory wall. The third level of the structure, however, in contrast to what has been presumed up to now, probably did not host further rows of spectators, but rather a portico: the most recent studies on Roman theatrical architecture have drawn attention to the need for a solution of this type to operate the *velarium* that sheltered the spectators from the sun.¹⁴ Therefore, to the hypothetical height of the building up to the *media cavea* (6.40 m), we must add about 3 m in height for the gallery in *summa gradatione*, as hypothesized for other theatres (e.g., the nearby Urbisaglia structure)¹⁵ and, with a good approximation, also for the structure of Falerio by P. Bonvicini (Luni 2003), reaching an overall height for the theatre of about 9.40 m.

Until now, a capacity of 1,600 spectators has been proposed. The method used by the De Minicis brothers to arrive at this calculation is curious: they made the excavation workers sit in the stands (Bonvicini 1971a: 107). This method may not be one of the most refined (Fuchs

¹⁴ An operation that needed a remarkable number of people (Gabellone *et al.* 2017). I am grateful to W. Fuchs for his advices especially about this aspect.

¹⁵ Cingolani 2020; in Verona a lower ambulatory of about 2.3 m has been hypothesized (Trochin and Bevilacqua 2022, 185).

2021, 392-3), but it is certainly effective. However, the capacity was calculated by inserting five rows of tiers in the *summa cavea*. It is therefore probably necessary to reduce it to 1,100 seats, although to this number we can perhaps add a limited contingent of high-ranking spectators hosted in the *proedria* and in the *tribunalia*. This is, however, a capacity that is adequate for a small city like *Falerio Picenus*.

We have already mentioned the epigraph relating to an embellishment of the theatre dating back to the age of Claudius (Bonvicini 1971a, 100). It was discovered 'in front of the first western *vomitorium*' and was carved on an arch-shaped slab, of which only a fragment is still preserved today. It was located above one of the entrances, most likely the one near which it was found. We consequently decided to remodel it on the basis of the preserved fragment and its drawing in the nineteenth-century excavation diaries¹⁶ (Fig.4).

We also know from the excavation diary of 1836 that two telamons holding large tragic theatrical masks were found close to the eastern *aditus* (Bonvicini 1971a, 101; Sear 2006, 156). It is not easy to hypothesize their precise original location. This type of couple-sculpture is most commonly found at the terminal point of the handrails at the base of the *analemmata*, as occurs in the theatre of Pietrabbondante (2-1 BCE) or in the small theatre of Pompeii (80-70 BCE) (Verzár Bass 1990, 415, Ortolani 2008; Di Napoli 2013, 144-6). Telamons without masks are also rather widespread: at *Iaitas*, *Tegianum Dianum* and *Aquileia* (Sear 2006, 149, 175). Based on these considerations, we decided to place them at the base of the *analemmata* in our 3D reconstruction (Fig. 6 and 7), even if some difficulties still persist. First of all, all sculptures are lost and the nineteenth-century excavators do not provide us with the dimensions; furthermore, the other telamons known in this position in the theatres are all kneeling, while those in the Falerio theatre were standing, so other possible locations were considered. One possible location, would be along the front of the *pulpitum* wall, as occurs in the theatres of Syracuse (Caruso *et al.* 2015, 25-6) and Segesta (D'Andria 2017, 83, pl. 10), that were decorated with several standing telamons. However, the Sicilian structures are too distant in time and location to be considered as reliable comparisons. A very similar telamon in a standing position was found in Benevento (Adamo Mucettola 1991, 206). It was discovered in a medieval wall, reused together with another kneeling telamon. Scholars have hypothesised that these elements were both taken from the city theatre, one from the *analemma* and the other from the *proscenium*; a second hypothesis is that the standing one decorated a city gate (Adamo Mucettola 1991, 206). Taking into account the analogy with the city gates and the point of discovery of the statues, is it possible that the telamons decorated the internal arch of the entrance to the theatre? In theatres, to our knowledge, this position is never attested for these statues. It is not an impossible solution and surely fascinating, but for the moment it seems less likely than the handrail one.

The discovery of a herm that portrays a character with Dionysian features recalls similar sculptures from the theatres of *Alba Pompeia* and Verona, where it is assumed that they decorated the corners of the parapet of the *tribunalia*. We also hypothesize a similar location here (Bolla 2010).

¹⁶ This interpretation was supported by the De Minicis Brothers, in Bonvicini 1971a 98-9; and recently also by Tosi 2003, 331. See also Cancrini, Delplace and Marengo 2001, 27.

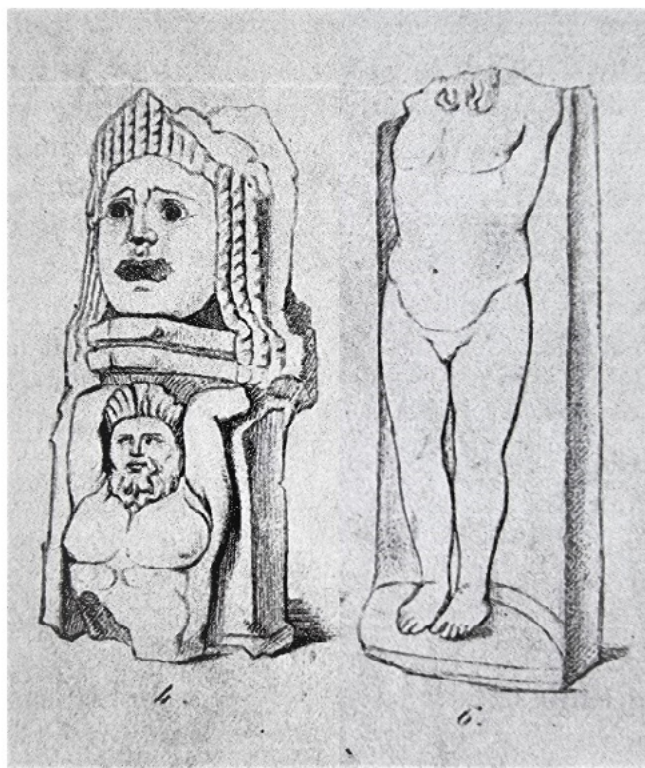


Figure 7. The two fragments of telamons identified during the nineteenth-century excavations (Bonvicini 1971a, p.101), our reconstruction and the hypothesis of its original placement (elab. Studio 111).

The modelling of the *summa cavea* and the hypothesis of the temple

As already mentioned, nothing remains of the *summa cavea*. For its reconstructions, we took in consideration the rare theatres where this portion of the building has been preserved. Erratic architectonic materials that could have come from this part of the building are also very rare: only some marble columns of 30 cm in diameter have been found (Sear 2006). In our model, we have created a gallery of slender columns on the internal front and an external wall with fenestrations useful for lightening the structure.

It is well known that ancient theatres had a strong connection with worship and sacredness. Vitruvius in fact writes ‘Apollini patrique Libero secundum theatrum’ (Vitr. I, 7, 1) and again ‘cum forum constitutum fuerit, tum deorum immortalium diebus festis eligendus est locus theatre’ (Vitr. V, 3, 1). For Quintilian the theatre can be defined as ‘a kind of temple’ (III, 8, 28-9). The cases of the famous Republican sanctuaries that highlight with their structures the strong the connection between temples and theatres, are also well known.

However, these are not the only cases known. The most complete and still fundamental study on the phenomenon remains the one by J. A. Hanson (1959). The scholar analysed all the possible architectural relationships between theatres and temples, and among the ‘imperial theatre buildings combined with temples’, he listed also the case of Falerio (Hanson 1959, 59, 76, pl. 44). Recently L. Maraldi (2002, 37) has focused on the problem and G. Tosi (2003, 738) has positively re-evaluated the proposal of the presence of a temple in the Falerone theatre. In Italy solutions of this type have been hypothesized for Cassino, Ercolano, Sepino and Fiesole, to which we can add *Leptis Magna*, Dugga, Tipasa, Calama, Philippeville, Timgad and Cherchel in Africa; Vienne, Lillebonne, Tulle and Vaisoie-La-Romaine in France; Sagunto in Spain; *Nicopolis* in Epirus; *Apamea* in Syria; and *Heracleia* in Bithynia. To my knowledge, further examples can be added, such as, for example, Amman in Jordan. In more recent times, a similar solution has also been hypothesized in Teano, Taormina, Volterra, *Alba Fucens*, *Iuvanum*, Spello, Pompeii, Arezzo, Pietrabbondante, Verona, Trieste, Squillace and various other cases (Tosi 2003, 735). It must be underlined that the certainty of the real existence of temples in *summa cavea* of these theatres is highly uneven and ranges from *aediculae* and shrines that are well preserved and still visible, such as in Amman or *Leptis Magna* (Bomgardner 2016), to completely hypothetical examples, such as that of Volterra. As far as the case of Falerone is concerned, Hanson assumes the existence of the temple only on the basis of the presence of the base for an equestrian statue (see below) outside the structure, placed on the central axis of the *valva regia*. The temple would be located in line with these, tracing a sort of sacred axis. However, in our opinion, there are also other more concrete elements to take into consideration which make the hypothesis plausible. Before Hanson, something similar had been proposed by Wieseler: he drew a central staircase twice the size of the others (Wieseler 1851, 19-20; Hanson 1959, 44). Therefore, it had to lead to a particularly important place, probably the temple, similarly to what has been hypothesized for the theatre of Trieste (Verzar-Bass 1991, 164). However, these data are very uncertain, and moreover, in various cases where the summit temple was clearly present, the stairs are not particularly large, and in some cases, there is no direct access from the *cavea*. In any case, the theatre of Falerone seems to have many elements in common with that of Urbisaglia and the latter was certainly equipped with a chapel in *summa gradatione*. The theater of Urbisaglia was built above an ancient place of worship (Perna 2006; Cingolani 2018, 2020): the chapel could be interpreted as a sort of restitution to the divinities of the space. The same could have happened



Figure 8. The small pediment that was created in the *summa cavea* to give the idea of the possible presence here of a temple (elab. Studio 111).

in *Falerio Picens*; in fact, in the area of the theatre a series of architectural terracottas for the decoration of a temple and some votive offerings from the Republican age were discovered in 1921 (Moretti 1921, 185-6), suggesting the presence of a temple in the same place, before the building of the theatre (Maraldi 2002, 103; Paci-Landolfi 2002, 313-322; Perna 2012, 383). This phenomenon is not unknown for the region (Perna 2012; Giorgi 2014.). A further element can be added to the discussion: an inscription recently reviewed by C. Delplace was found inside the theatre and mentions the construction of an *aedes*: ‘*aede[m] / de sua [pecunia]*’ (CIL IX 5423, Cancrini-Delplace- Marengo 2001, 24-25, 90). On the basis of these considerations, we have decided to model a small pediment in the *summa cavea* (Fig. 8) suggesting the presence of the temple in a deliberately vague way, without adding further elements in order to provide the visitor with this hypothetical structure, but without creating a totally false reconstruction.

The orchestra

The *orchestra*, the area that separated the spectators from the stage, was always paved with stone slabs in Roman theatres. The eighteenth-century excavations reports tell us about the discovery of fragments of cipollino marble slabs in this area, clearly part of the pavement of the *orchestra*. This seems to be contradicted by the excavation report of 1836 (Bonvicini 1971a), which reports the presence of travertine slabs, but in reality, it mentions the discovery of a single slab which was anchored to the ground because someone had tried to steal it during the excavations. Our conclusion is that there was a multi-material pavement, as in many other cases.¹⁷ In the model we have therefore paved the orchestra with of slabs of two materials. This flooring, according to the excavation diaries of the time, was placed 60 cm below the

¹⁷ Sear 2006, 81 states that the orchestras received marble flooring only from the Augustan age, perfectly confirming the chronology of the theatre. An interesting information is reported by Catani (1989, 217): at Villa Cecchi, in the nearby hamlet of Convento, she saw numerous limestone slabs in the walls, some of which were curved and bore traces of a drainage channel. They could actually be the slabs of the theatre orchestra.

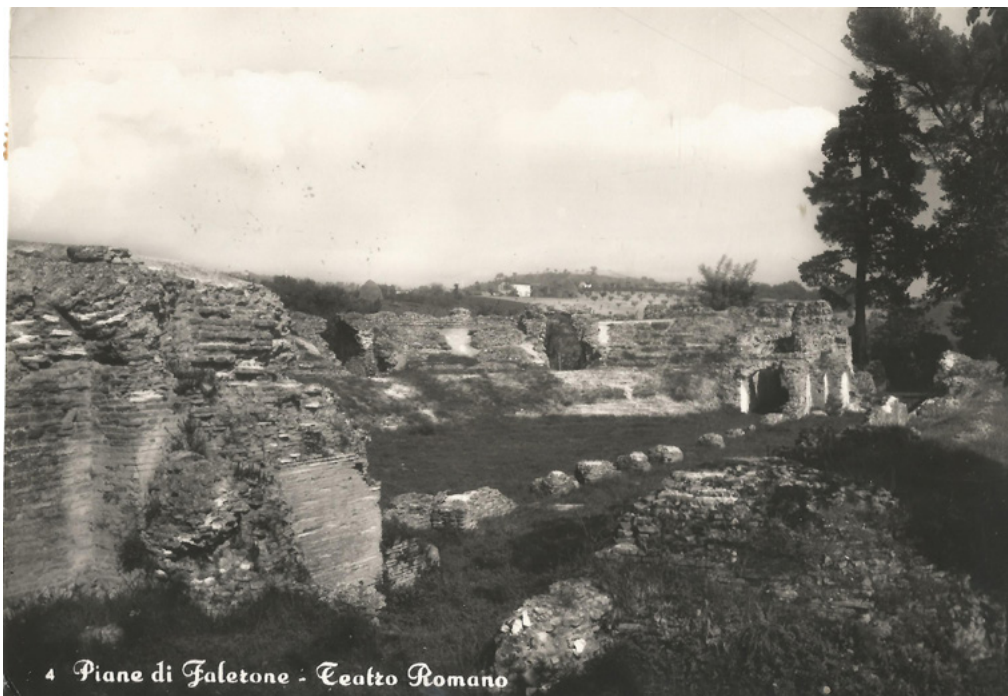


Figure 9. 1962 postcard showing the state of preservation of the scene and the proscaenium of the Theatre of Falerio Picenus before modern restoration.

external walking surface,¹⁸ and we took this into account during the modelling operations. We added a *balteum*, a parapet that separated the orchestra from the *cavea*, since a large marble slab vertically fixed was found during the nineteenth-century excavations (De Minicis 1839, 14). In front of the *balteum* we modelled the *proedria*, stone steps from where the most notable people of the town watched the performances. These are not archaeologically documented, because this part of the building was particularly poorly preserved already in the nineteenth century. Otherwise, we should imagine some *subsellia*, elegant wooden seats.

The *pulpitum* and the stage

Beyond the orchestra the *pulpitum* wall developed. It was largely rebuilt after the 1960s, as proved, for example, by a 1962 postcard (Fig. 9). Our 3D reconstruction relies in the fact that it is canonical for Roman theatres to have *pulpita* that alternate curvilinear with squared niches about 1.50 m wide. Originally the wall must have been ca. 1.45 m high (Montali 2015, 71), as stated by Vitruvius (Sear 1990) and as can be seen in other theatres of the region. It was equipped with 4 little stairs that allowed access to the stage. Small bronze statues were perhaps housed in the niches, and in the nineteenth-century excavations statuettes of a household's guardian and a lictor were found here (Bonvicini 1971a, 103), something that is not attested in other theatres. Generally, the statuary decoration of this portion of the

¹⁸ This happens quite frequently in Roman theatres, for the case of Verona, see Bolla 2010 and Tronchin and Bevilacqua 2022.

building is never reproduced in models and, in fact, reliable hypotheses cannot be made even for Falerio (Maraldi 2002, 36; Bolla 2010).

Between the *pulpitum* wall and the *scaenae frons*, there was the *proscenium*, the stage: it was a wooden deck (33.20 m x 4.60 m) where the actors performed, built over an underground chamber that functioned as a resounding chamber. Nothing remains but the joints for the boards. In the part closest to the *orchestra* there were 6 pits, measuring 30x30 cm, and 1.95 m deep (Maraldi 2002, 36), that housed the poles that were used to raise and lower the curtains (*auleum*), very well preserved in Falerio Picenus (Fincker -Moretti 2010).

The *Scaenae Frons* (Fig.10)

The *scaenae frons* is one of the most difficult parts of the theatre to reconstruct since, as noted by other scholars (Limoncelli 2019, 19), it is frequently poorly preserved; therefore, not only actual archaeological data, but also comparisons are scarce. In our case, even the few remains are difficult to access due to the modern stage built to make the structure usable for shows, which covers the *scaenae frons* and the *proscenium*. We therefore rely mainly on previous surveys and attempted a difficult survey with a laser scanner. It can be deduced from previous document that the *frons scaenae* should have been rectilinear, with three entrances, like those of *Herculaneum*, *Iguvium*, Arles, *Ostia*, Cassino, *Italica* and many others. All of these examples are inspired by the archetype constituted by the theatre of Marcellus in Rome (Pensabene, De Nuccio 2010, 59; Sear 2006, 83). In fact, the plan of the theatre drawn up by F. Dessi in the nineteenth century shows the presence of aligned plinths on which 14 columns were arranged.¹⁹



Figure 10. 3D reconstruction of the *scaenae frons* of the theatre of Falerio Picenus (elab. Studio 111).

¹⁹ This drawing can be considered reliable, since this is the canonical number of columns for straight *frontes scaenae*, a fact not known at the time (Montali 2015).

Since the theatre of Falerio is very small in size (the structure is only about 9.40 m high), we must imagine a not very high *scaenae frons*, having only two levels. This type is frequently attested in the Augustan age (e.g., in *Augusta Bagiennorum*, Limoncelli 2019, 43) and described by Vitruvius. The plinths were seen in the eighteenth century and drawn by B. Agabiti (Fig.11), and were richly decorated. They were of two different types, consisting of precious marbles of various colours: porphyry, giallo antico marble and pavonazzetto, as described in detail in the eighteenth century (Bonvicini 1971b, 124). One of the two typologies was even still endowed with bronze decorations (Bonvicini 1971b, 124): metallic festoons and bucrania which can be compared with some similar fragmentary decorations discovered in Verona, and which are reproduced in the 3D model, inspired also by similar decorations in other monuments of the time, such as the *Ara Paics Augustae* in Rome. B. Agabiti only gives us the measurements of the plinth decorated with metal festoons which was 9 palms of the papal state (ca. 2 m), while the second type of plinth is shorter and less slender.²⁰ We could hypothesize that the central door was architecturally enhanced, as happens very frequently in theatrical *frontes*

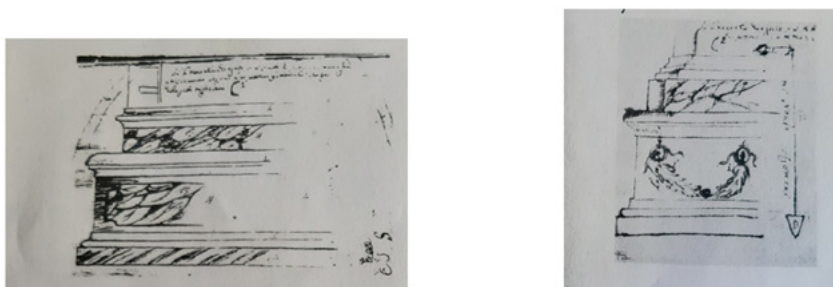


Figure 11. Plinths of the theatre of Falerio Picenus. Above, as drawn in the eighteenth century (Bonvicini 1971, 124-5) and below our reconstruction (elab. Studio 111).

²⁰ Bonvicini 1971b; Montali 2015, 74-75. Peculiar plinths are attested for example in the theatre of *Augusta Bagiennorum*, Limoncelli 2019, 43.

scaenae (Pensabene-De Nuccio 2010, 62). This can be seen for example in the Cassino theatre, where the central plinth is lower, so that the columns on it were higher. We opted of a similar solution in *Falerio Picens*, in order to give particular emphasis to the *valva regia* (Fig.11).

G. Montali (Paci-Montali 2011) focused on a lintel, recomposed from three fragments (Fig.12) and two other similar architectural elements not matching each other (one of them bears an inscription by the emperor Probus, obtained by erasing its decoration in a later phase). All these elements are decorated with a particularly elaborate botanical-design frieze, and Montali hypothesized that they could be part of the decoration of the *scaenae frons* due to the particularly exuberant decoration, the fact that the architrave is also decorated in the lower face, and because these elements, although not found inside the structure, do not adapt well to other types of buildings. Montali himself was very cautious in this proposal, thinking that the close rhythm of the columns of a *frons scaene* did not adapt well to this architectural element. Our model confirms that Montali was right. In fact, the architectural element could decorate the aedicules above the side doors of the *frons scaene* which are 2.1 m wide; the lintel is 3 m long and could fit perfectly, taking into account the space occupied by the columns. The central door is 3 m and would need a longer architrave (Maraldi 2002, 36; Tosi 2003, 330), maybe the one with the inscription of Probus which was originally longer and had to be in the centre for greater visibility. On the basis of the height of the lintel (46 cm high), we can assume columns with a base that was 15 cm high, a shaft of 2.47 m and a capital 34 cm high. The width of the column should be around 31 cm. This system, quite thin, could be part of the second level of the *frons scaene*. The first one can be reconstructed, according to the Vitruvian principles, with bases of 18.75 cm, shafts of 3.08 m, 42.5 cm-high capitals and a 57.5 cm architrave. The diameter of the column was 38.7 cm, similar to some examples in Ostia (Pensabene, De Nuccio



Figure 12. Architrave decorated with a particularly elaborate botanical-design frieze, probably belonging to the theatre. Here you can see the process to create the virtual element from merged photos (Studio 111).

2010, 72). We do not have any reliable data regarding the architectural order of the columns, but we suggest that they could have been Corinthian, based on the frequency of this type in these structures (Fuchs 2021, 381). We also have no example of a column left. From the reports of the nineteenth-century excavations of the scene area, however, we are informed of the discovery of fragments of white marble and limestone, 'breccione', giallo antico and other unspecified types of marble (Bonvicini 1971a, 105); therefore, it had to be a very elegant and multi-material stage backdrop. In the 3D reconstruction we proposed a first order in white marble and the upper one in coloured marbles, according to what was attested, for example, in Ostia, in that case, grey and cipollino marble (Pensabene, De Nuccio 2010, 72) and in *Augusta Bagiennorum* (white marble on the first level and giallo antico and bardiglio marble on the second) (Limoncelli 2019, p. 43).

On both sides of the stage building there must have been walls leaning against the one behind the scene; it was important to support a deck for the roof. However, no trace of these were found, so we modelled it on the basis of comparisons with other models (such as the ones of Lecce and Catania) or better-preserved structures, such as the theatre of Volterra (Fuchs 2021, 382).

Behind this architectural backdrop there was the *postscenium*, a narrow and elongated space (33 x 4 m), characterized by a peculiar V-shaped buttress which, to date, does not find good structural comparisons (Maraldi 2002, 37, n. 143).

The statues of the *scaenae frons*

The 14 columns of the two levels of the *scaenae frons* created 11 large niches (4 in the first level and 7 in the second one, Fig. 6) which, as in any ancient theatre, were originally occupied by statues (Ramallo Asensio, and Röring 2010). The reconstruction of the statuary groups is not simple: statues of different chronology coexisted on the *frons scaenae* as proved by a mid-2nd century CE epigraph that mentions the donation of statues to complete its decoration by Antonia Picentina, priestess of the Diva Faustina (CIL 5428), and most of them are now lost. In the nineteenth-century excavations three magnificent marble statues were discovered in the vomitoria of the theatre, whose datation is problematic;²¹ from the excavation diaries it is clear that they were about to be calcinated, since fragments of calcined marble were found with them. Their identification is uncertain, but they probably represented Demeter/Ceres (the best preserved, 2.07 m high, Fig.2), Venus (similar to the famous Aphrodite of Milos) and Jupiter Aegiochos (De Angeli 1987). We can add a head of Augustus of the type of Prima Porta discovered by P. Bonvicini in the 'scraps' of the De Minicis collection in Fermo. The statue of a man in a toga, traditionally associated with the theatre, seems instead to be linked to the amphitheatre (De Angeli 1987). In addition to these, we can postulate the presence of a statue of Commodus and that of Gaius Caesar, on the basis of the presence of epigraphs, probably attributable to the pedestals. It can be less certainly hypothesized that the epigraph dedicated to Octavia, mentioned above, also belonged to a statue and I consider it very likely that *Antonia Picentina* dedicated a statue to Faustina, as a priestess of her cult.

²¹ M. Fuchs (1987, 62-66) traces them back to the Trajan age, while S. De Angeli (1987) and Delplace (1996, 123) are vaguer.

We can therefore recognize two groups of statues: the first portrayed the imperial family (Gaius Caesar, Augustus and Commodus, perhaps Octavia and Faustina); the other, divinities (Demeter, Venus, Jupiter). We propose that the statue of Augustus of the type of Prima Porta was in the centre, as also assumed for the Roman theatre of Lecce. It would be a tangible tribute of the person who transformed Falerio into a colony and probably promoted the construction of the theatre itself.

As for the model, we were uncertain on how to reproduce the statues. Vague and unrecognizable representation would have clashed with perfect statues such as the ones preserved or the ones with a known archetype. In order not to deceive the visitor, however, it would be necessary to find a way to make them understand what was there and what is only hypothesized. No solution seemed satisfactory to us, so we preferred, for the moment, to leave all the niches empty.

The external part of the theatre

For economic reasons, it was decided, for the moment, not to model the exterior of the structure, but, in order to acquire a better understanding of the theatre in all its complexity, it was necessary to study it in its entirety, so we also gathered all the data necessary for the future modelling of this part of the building.

The outer portico

For the general harmony of the structure, the scholars agree that, already in the first construction phase, there was a perimeter portico around the theatre. Its vault was covered in frescoes, as affirmed by the first excavators (Bonvicini 1971b, p. 390) and two wider pillars on the sides of the *versurae*. The pillars were at a distance of 2.70 m from one-another. Today the distance varies between 2.60 and 2.90 m, most likely due to the modern-age restorations, except for the central one, which is 3.40 m wide. This was, in fact, the location of the base for the statue described in the next paragraph.²² These semi-columns were probably covered with yellow mortar at an initial phase (Bonvicini 1971b), but definitely at a time when the town was prospering, these were covered with slabs of giallo antico marble, as indicated by the discovery in the nineteenth century of curvilinear thin fragments of this material.

The first excavators write of Doric columns (Bonvicini 1971b, 390); the De Minicis brothers hypothesize an Ionic or Corinthian order, while Bonvicini opted for the Ionic order (Bonvicini 1971a, 476; 1971b, pl.3). We agree with G. Montali that it is likely that the colonnade was of the Ionic or Corinthian architectural order, which would better adapt to the Ionic bases and given the frequency of these orders for these porticoes (for example, in the theatre of Verona, of the Augustan age), but also because P. Bonvicini mentions the discovery of carved brick elements 'with carved ovuli and another with acanthus leaf' (Montali 2015, 65-67; Bolla 2010).

The peculiarities of the larger central arch, having more refined molding of the bases, and more slender and more protruding columns, suggests the possibility, already supposed by Montali, that they differed in order and perhaps also in the material used to cover them, as

²² Measures were verified personally. See also Maraldi 2002; Montali 2015 and the unpublished survey by Arch. Masturzo.

attested, in later leisure buildings such as the Colosseum. This would explain the discovery of thin elements to cover columns in pink marble and coral breccia reused in the area (Montali 2015, 66-67, n. 50). The *cavea* was surrounded by a paving in Istrian stone according to the eighteenth-century excavations (Bonvicini 1971a, p. 109), useful for providing better access to each entrance to the structure even in the case of rain.

The statue base

A platform was inserted inside the central archway of the external portico. It is a pebble and mortar arrangement, now mostly covered with soil. This structure measures 2.21 x 3 m at the base. Starting from the bottom, after 34 cm it has an 8 cm deep recess on all sides and rises for another 39 cm. At the top it is 205 cm wide and the possible length is 284 cm. The base was originally supposed to be higher, as evidenced by the nucleus of concrete projecting above it.

We agree with those who interpreted it as the base of an equestrian statue, given the elongated proportions and because of the fact that some fragments of a large, golden bronze statue were found here, with some fingers, a fragment of footwear, one of drapery (Bonvicini 1971a, p. 100-1).

An equestrian statue was placed in the theatre of Thugga, but it is attested only epigraphically (CIL VIII, 26622). A statue of this type was also housed in the theatre of *Herculaneum* and fragments of a statue on horseback have also been identified in that of Verona (Bolla 2010, 38). However, in these cases, the statues were located inside the structures and not outside.

It is difficult to establish who could be represented here. Such a prestigious position is perhaps more suited to an emperor than to a citizen, however wealthy. The fact that Domitian's edict was found right in front of the statue seems to suggest this emperor. However, we have seen that it is very likely that a portico, albeit a very simple one, with stuccoed columns, was present since the foundation of the structure, so it is possible that the equestrian statue can be attributed to Augustus, although only one young portrait of him on horseback was discovered.

Conclusions

The overall dimensions of the structure were obtained with an accurate 3D laser scanner survey and completed on the basis of comparisons with better-preserved buildings from the same period; for this we have tried to represent the real elements seen in ancient times, such as epigraphs, marble coatings, bronze decorations and statues.

We are aware of some limits related to what has actually been preserved, to the presence of some decorative elements found in the theatre whose location is unidentified, for example a small round relief of Hercules or two fragments decorated with an eagle (Bonvicini 1971a, 103) and because of the documentation of the first excavations which, at times, is not very accurate, with vague descriptions of the materials used, drawings without scale, walls found that were not fully understood and therefore were not adequately represented, all of which led, especially as regards the area around the scenic building (possible basilicas or stairs, *porticus post scaenam*, etc.), to some inconsistencies that it may only be possible to resolve with new research campaigns and excavations. In every three-dimensional reconstruction of an ancient building there is always a percentage of uncertainty, we could add that we are well

aware of some errors. The first question that comes to mind is ‘is this the theatre the Romans saw?’, ‘What is the degree of ‘authenticity’ of this reconstruction?’; A question that implies also philosophical issues (Kynorgiopolou 2000), although in this specific case there was an abundance of elements available.

The main problem is that we are forced to show just a building phase in our reconstruction, while the monument evolved in time, and its history, that a good archaeologist should be capable of ‘reading’ in masonry, constitutes part of its identity and of its authenticity (Thomson 2008). However, it seems to us an important work not only because it will attract new attention to the site and enable tourists to understand it better; also because it represents a true ‘democratization’ of cultural heritage, since the inhabitants of Falerone will be able to view the statues found here without being forced to go to the Louvre Museum or look at some decorations without going to the Vatican Museums; but above all, because the 3D reconstruction was used as a real research tool and it increased significantly our knowledge on the site.

The work is not finished yet: we have acquired the data, but still not modelled the exterior of the building and we are still wondering how to deal with the problem about the statues of the *scaenae frons*, and the way we will chose to operate will mean the model can easily be improved or changed in the future in the event of new findings or studies (Limoncelli 2019, 22-23).

Certainly, some difficult choices had to be made, and it is important that the scientific community is aware of them.

We informed the research community of this through this publication, but we are trying to identify intuitive methods to make the visitor understand which elements of the reconstruction are certain and still preserved, which are almost sure and not preserved, and which have been reconstructed on the basis of comparisons with structures or with similar decorations. In fact, even if a look through the smartphone allows us ‘to deliver complex computations in a simple, appropriate way for a heterogeneous and generic audience’ (Gabellone et alii 2017), we believe it is right that everybody should be aware of the so-called paradata, the hidden level of information behind a reconstruction.²³ As reported in paragraph 4.6 of the London Charter for the computer based visualisation of Cultural Heritage:

*Documentation of the evaluative, analytical, deductive, interpretative and creative decisions made in the course of computer-based visualisation should be disseminated in such a way that the relationship between research sources, implicit knowledge, explicit reasoning, and visualisation-based outcomes can be understood.’*²⁴

Indeed, we would like to stimulate even the tourist’s curiosity about this approach, so that he can understand how much work and study goes into creating a three-dimensional reconstruction.

²³ As noted also by Viccei 2019, 85. In the glossary attached to the London Chart you can read the definition: Paradata Information about human processes of understanding and interpretation of data objects. Examples of paradata include descriptions stored within a structured dataset of how evidence was used to interpret an artefact, or a comment on methodological premises within a research publication. It is closely related, but somewhat different in emphasis, to ‘contextual metadata’, which tend to communicate interpretations of an artefact or collection, rather than the process through which one or more artefacts were processed or interpreted. See also the Pompey project, Beacham-Denard 2003

²⁴ http://www.londoncharter.org/fileadmin/templates/main/docs/london_charter_2_1_en.pdf

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Bibliography

- Adamo Muscettola, S. 1991. 'Appunti sulla cultura figurativa in area Iripina', in *La romanisation du Samnium aux iie et ier s. av. J.-C: Actes du Colloque International (Naples 1988)*. Napoli: Publications du Centre Jean Bérard.
- Barcelò, J. 2001. 'Virtual reality for archaeological explanation beyond 'picturesque' reconstruction', *Archeologia e Calcolatori* 12, 221-244.
- Barcelò, J. A.; Forte M. and Sanders, D.H. 2000. *Virtual reality in archaeology*. Oxford: Archaeopress.
- Beacham, R. and Denard H. 2003. 'The Pompey Project: Digital Research and Virtual Reconstruction of Rome's First Theater'. *Journal of Computers and the Humanities* 37, 129-140.
- Bennardi, D. and Furferi, R. 2007. 'Il restauro virtuale tra ideologia e metodologia'. Firenze: Edifir.
- Bejor, G. 1979. 'L'edificio teatrale nell'urbanizzazione augustea'. *Athenaeum* 57, 124-138
- Bianchini, C. and Potestà, G. 2018. The critical reconstruction of the Temple – Theatre complex in the Italic Sanctuary of Pietrabbondante. On line: EasyChair pre-prints service.
- Bilis, T., Kouimtoglou, T., Magnisali, M. and Tokmakidis, P. 2017. 'The Use of 3D Scanning and Photogrammetry Techniques in the Case Study of the Roman Theatre of Nikopolis. Surveying, Virtual Reconstruction and Restoration Study'. *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences* XLII-2, 97-103.
- Bolla, M. 2010. Il teatro romano di Verona e le sue sculture. Verona: Cierre edizioni.
- Bomgardner, D. 2016. 'The Theatre-Temple Complex at Lepcis Magna: Multiple dimensions of functionality or There's more than one way to act on the emperor', in *Theaterbauten als Teil monumentaler Heiligtümer in den nordwestlichen Provinzen des Imperium Romanum: Architektur, Organisation, Nutzung*. Edited by Th. Hufschmid, 63-80. Basel: Augusta Raurica Museum press.
- Bonini, F. 2022. 'Falerio Picenus. Indagini e rinvenimenti nell'area dell'antica colonia della Valtenna'. Master degree thesis, University of Bologna.
- Bonvicini, P. 1954. 'Il Teatro ed altri monumenti di Falerio Picenus'. *Studia Picena* XXII, 33-44.
- Bonvicini, P. 1971a: 'Il giornale degli scavi eseguiti nel 1836 nel Teatro romano di Falerone, redatto da Raffaele De Minicis', *Rendiconti dell'Accademia dei Lincei* XXVI, 371-383. Published also in Paci 1995, 93-113.
- Bonvicini, P. 1971b. 'Schizzi inediti degli scavi di Falerio Picenus eseguiti nel 1717 dal notaio faleronese Barnaba Agabiti'. *Rendiconti dell' Accademia dei Lincei* XXVI, 385-410. Published also in Paci 1995, 115-153.
- Bonvicini, P. 1991. Falerone. Dall'antichità al Medio Evo... gli scavi archeologici di Falerio Picenus. Fermo: Andea Livi editore.

- Campagnoli, P. and Giorgi, E. 2006. 'La viabilità delle marche centro meridionali in età tardo antica e altomedievale'. *Studi Maceratesi* 40, 111-156.
- Campanari, S. 1840. *Teatro di Faleria nel Piceno descritto da Secondiano Campanari*. Roma 1840.
- Cancrini, F.; Delplace, C. and Marengo, S.M. 2001. 'L' evergetismo nella Regio V (Picenum)'. *Picus*, suppl.8.
- Caruso, F.; Gabellone, F.; Ferrari, I. and Giuri, F. 2015. 'Nuove proposte ricostruttive per una rilettura critica della documentazione archeologica su Siracusa in età greca'. *Virtual Archaeology Review* 6, 19-28.
- Catalani, M. 1778. *Origini e antichità fermane*. Fermo: Lazzarini Stampat. Capitol.
- Catani, E. 1989. 'Scavi pontifici del 1777 nella Marca anconetana: Marano, Recina, Falerone, Urbisaglia', in *L'antichità classica nelle Marche tra Seicento e Settecento, Atti del convegno, Ancona - Pesaro, 15-16-17 ottobre 1987. Deputazione di Storia Patria per le Marche*, 191-274.
- Cecchi, S. 2016. 'Ipotesi sulla ricostruzione del teatro di Falerone'. *Facade*, 12-15.
- Cingolani, S. 2018. *Il teatro romano di Pollentia-Urbs Salvia*. Ph.D. diss. Macerata University.
- Cingolani, S. 2020. 'Il teatro romano di Pollentia-Urbs Salvia: per una nuova interpretazione del complesso architettonico' in *Munera amicitiae. Miscellanea di studi archeologici per Enzo Catani*, edited by E. Stortoni, 105-130. Macerata: Eum edizioni.
- Cogitore, I. 2000. 'Les honneurs italiens aux femmes de la familles impériale de la mort de César à Domitien', in *Les élites municipales de l'Italie péninsulaire de la mort de César à la mort de Domitien. Collection de l'École française de Rome* 271, 237-266.
- Colucci, G. 1788. 'Memorie e antichità di Falerio'. *Antichità Picene* 3, 285-332.
- D'Andria, F. 2012. 'Archaeology of the theatre in Hierapolis (Pamukkale)', in *Restoration and Management of Ancient Theatres in Turkey. Methods, Research, Results*, edited by F. Masino, P. Mighetto, G. Sobrà, 143-161.
- D'Andria, F. 2017. 'Illustrare Segesta e il suo teatro'. *Sicilia Antiqua* 14, 77- 84.
- De Angeli, S. 1987. 'Su alcune sculture di età romana da Falerio Picenus'. *Studi Urbinati* 60, 57-75.
- Delplace, C. 1996. 'Le théâtre de Falerio dans la regio V (Picenum): interventions publiques et privées'. *Ktema* 21, 117-125.
- Di Napoli, V. 2013. *Teatri della Grecia romana: forma, decorazione, funzioni. La provincia d'Acaia*. Athens: Meletemata.
- Finat, J.; M.A., Iglesia Santamaría; Martínez Rubio, J.; Fernández Martín, J.J.; Giuntini, L.; San José Alonso, I.; and Tapias, A. 2005. 'The Roman Theatre of Clunia: Hybrid Strategies for Applying Virtual Reality on Laser Scanning 3d Files'. *Paper presented at the Proceedings of the ISPRS Working Group V/4 Workshop 3dARCH 2005, Mestre-Venice, Italy, August 22- 24, 2005*.
- Fincker, M. and Moretti J-Ch. 2010. 'Le rideau de scène dans le théâtre romain', in *La scaenae frons en la architectura teatral romana*, edited by S. F. Ramallo Asensio, N. Röding, 309-329.
- Forte, M. 1997. *Virtual Archaeology: Great Discoveries brought to life through virtual reality*. London: Thames and Hudson.
- Forte, M. 2004. 'Realtà virtuale, beni culturali e cibernetica: un approccio ecosistemico'. *Archeologia e calcolatori* 15, 423-4.
- Forte, M. 2007. 'Ecological Cybernetics, Virtual Reality, and Virtual Heritage', in F. Cameron, S. Kenderline (ed.), *Theorizing Digital Culture Heritage. A Critical Discourse*, Cambridge 2007, pp. 389-407
- Forte, M. 2014. 'Virtual Reality, Cyberarchaeology, Teleimmersive Archaeology', *3D Recording and Modelling in Archaeology and Cultural Heritage: Theory and Best Practices*, edited by F. Remondino and S. Campana, 113-127.
- Forte, M. 2015. 'Cyberarchaeology: a Post-Virtual Perspective', in *Humanities and the Digital. A Visioning Statement*, edited by D.T. Goldberg, P. Svensson, 295-309.

- Fuchs, M. 1987. Untersuchungen zur Ausstattung römischer Theater in Italien und den Westprovinzen des Imperium Romanum. Mainz am Rhein: P. von Zabern..
- Fuchs, W., 2020. 'Confronting Vitruvius The Geometric Framework of Roman Theaters', in *La porticus post scaenam en la arquitectura teatral romana: actas del symposium internacional*, edited by S. F. Ramallo Asensio, E. Ruiz Valderas, 241 -255.
- Fuchs, W. 2021. 'A study of the geometric and architectural composition of the Roman theatre', in *Volterra, in 2021, Velathri Volaterrae. La città etrusca e il municipio romano*, edited by M. Bonamici and E. Sorge, *Studi Etruschi* 64, 381-396.
- Gabellone, F. 2017. 'The reconstruction of archaeological contexts: a dialectical relationship between historical-aesthetic values and principles of architecture', in *Sensing the Past* 16, edited by N. Masini, F. Soldovieri, 395-417.
- Gabellone, F., Ferrari, I. and Giuri, F. 2017. 'Un contributo alla ricostruzione del teatro di Taormina', in *Lifting theatre. La straordinaria risposta alla sfida del G7 di Taormina*, edited by V. Greco 114-125.
- Gianolio, S. 2012. Archeologia Virtuale. La metodologia prima del software, Atti del II seminario. Roma: Espera srl.
- Giorgi, E. 2000. 'La via consolare Salaria e le sue diramazioni nel territorio', in *Atlante dei beni culturali dei territori di Ascoli Piceno e Fermo. Beni Archeologici*, edited by G. De Marinis and G. Paci, 145-153. Cinisello Balsamo:
- Giorgi, E. 2014. 'Il territorio della colonia. Viabilità e centuriazione', in *Storia di Ascoli dai Piceni all'età Tardoantica*, edited by G. Paci, 223-289. Acquaviva Picena: Librati.
- Giorgi, E. 2020. 'Il problema dei confini meridionali dell'agro fermano' in *Il Santuario di Monte Rinaldo. La ripresa delle ricerche (2016-2019)*, edited by E. Giorgi, F. Demma, F. Belfiori, 22-25. Bologna: Bononia University Press.
- Giorgi, E. 2021. 'Diramazioni della Salaria sul versante adriatico', *Atlante Tematico di Topografia Antica* 31, 147-166.
- Giorgi, E. and Demma, F. 2018. 'Riflessioni sulla genesi e lo sviluppo urbano di Asculum nel Piceno. Dalla città federata alla colonia romana'. *Atlante Tematico di Topografia Antica* 28, 53-76.
- Hanson, J.A. 1959. *Roman Theater-Temples*. Princeton: Princeton University Press, 1959.
- Kynourgiopoulou, V. 2000. 'Authenticity: Reality versus Imaginative Reconstruction—Self Promotion as a Criterion for Identity and Place'. *EAR* 27, 101-26.
- Limoncelli, M. 2012. *Il restauro virtuale in archeologia*. Roma: Carocci.
- Limoncelli, M. 2019. 'Ricostruzioni digitali per lo studio degli spazi teatrali dall'età arcaica all'età imperiale', in *Indagini archeologiche e ricostruzioni digitali per lo studio degli spazi teatrali greci e romani. Visioni e prospettive*, edited by M. Limoncelli, F. Sacchi, R. Viccei, 16-45. Milano: Educatt.
- Luni, M. 2003. 'Edifici pubblici e privati. Teatri', in *Archeologia nelle Marche. Dalla preistoria all'età tardo antica*, edited by M. Luni, 242-250. Firenze: Nardini
- Maldonado, T. 2005. *Reale e Virtuale*. Milano: Feltrinelli.
- Malfitana, D. 2017. 'Archeologia, ricerca, tecnologia e comunicazione del passato', in *Lifting Theatre. La straordinaria risposta alla sfida del G7 di Taormina*, edited by V. Greco, 102-111. Milano.
- Manzetti, M.C. 2016: '3D Visibility Analysis as a Tool to Validate Ancient Theatre Reconstructions: the Case of the Large Roman Theatre of Gortyn'. *Virtual Archaeology Review* 7. 15, 36-43.
- Maraldi, L. 2002. 'Falerio'. *Atlante tematico di Topografia Antica*, XIII supplemento.
- Marengo, S.M. 2008. 'Octavia Soror Divi Augusti'. *Picus* 28, 193-204.

- Montali, G. 2015. 'I fratelli De Minicis e la riscoperta del teatro di Falerone: spigolature architettoniche', in *I fratelli De Minicis. Storici, archeologi e collezionisti del Fermano*, edited by G. Paci, 51-80. Fermo: Andrea Livi editore.
- Ordasi, Z. 2016. 'Il teatro romano – teoria e pratica. Il teatro di Falerone'. *Facade*, 8-11.
- Ortolani, G., 2008. 'Vitruvio (I, 1, 5) e la cultura dell'architetto. Cariatidi e telamoni nell'architettura imperiale'. *Quaderni dell'Istituto di Storia dell'Architettura* 51, 3-16.
- Mele, G. and Maniglio, G. 2015. 'The nonagon as a tool for the drawing of the Roman Theatre of Lecce'. *Disegnarecon* 8, 16.1-15.
- Moretti, G. 1921. 'Falerone. Trovamenti fortuiti nella zona dell'antica Falerio'. *Notizie dagli Scavi di Antichità*, 179-186.
- Ordasi, Z. 2016. 'Il teatro romano – teoria e pratica. Il teatro di Falerone'. *Facade*, 8-11.
- Ortalli, J. 1994. 'I teatri romani dell'Emilia Romagna'. *Antichità Altoadriatiche* 41, 271-300.
- Paci, G. 1995. *Scritti su Falerone romana*. Tivoli: Editrice Tipograf.
- Paci, G. 2020. 'Theodor Mommsen a Falerone', in *Munera amicitiae. Miscellanea di studi archeologici per Enzo Catani*, edited by E. Stortoni, 179-193. Macerata: Eum edizioni.
- Paci, G. and Landolfi, M. 2002. 'Falerone, (AP)'. *Picus* 22, 313-322.
- Paci, G. and Montali, G. 2011. 'Un restauro edilizio a Falerone sotto l'imperatore Probo', in *Scritti di Storia per Mario Pani*. Edited by S. Cagnazzi, Documenti e Studi 48, 2011, 347-371.
- Pasquinucci, M., Menchelli, S. and Scotucci, W. 2000. 'Viabilità e popolamento tra Asculum e Firmum Picenum', in *La Salaria in età antica*, edited by E. Catani and G. Paci, 353-370. Roma: L'Erma di Bretschneider.
- Pensabene, P. and De Nuccio M. 2010. 'Frontescene rettilinee nei teatri italiani: i casi di Roma (Teatro Marcello), Ostia, Cassino e Taormina', in Ramallo Asensio- Röring 2010, pp. 57-99.
- Perna, R. 2012. 'Nascita e sviluppo della forma urbana in età romana nelle città del Piceno e dell'Umbria adriatica', in *I processi formativi ed evolutivi della città in area adriatica*, edited by G. de Marinis, G.M. Fabrini, G. Paci, R. Perna, M. Silvestrini, ' , BAR International Series 2419, 2012, pp. 375-412.
- Quilici, L. 2007. 'La via Salaria: una grande strada di comunicazione dall'uno all'altro mare'. *Studi Maceratesi* 14, 65-91.
- Remondino, F. and Campana, S. 2014. 3D recording and modelling in Archaeology and Cultural Heritage, Oxford: BAR publishing.
- Ramallo Asensio, S. 1999. *El programa ornamental del teatro romano de Cartagena*. Murcia: Caja Murcia.
- Ramallo Asensio, S. and Röring, N. 2010. 'La scaenae frons en la arquitectura teatral romana', in *Actas del Symposium Internacional celebrado en Cartagena los días 12 al 14 de marzo de 2009 en el Museo del Teatro Romano*, Murcia.
- Sear, F. 1990. 'Vitruvius and Roman theatre design'. *AJA* 94, 55-68.
- Sear, F. 2006. *Roman theatres: an architectural study*. Oxford: Oxford University Press
- Small, D.B. 1983. 'Studies in Roman Theater Design'. *AJA* 87-1, 5-68.
- Sommella, P. and Migliorati, L. 1988. *Italia antica. L'urbanistica romana*. Roma: Jouvence.
- Thomson, R. G. 2008. 'Authenticity and the Post-Conflict Reconstruction of Historic Sites'. *CRM: The journal of Heritage Stewardship* 5.1.
- Tosi, G. 2003. *Gli edifici per spettacoli nell'Italia Romana*. Roma: Quasar editore.
- Tronchin, L. and Bevilacqua, A. 2022. 'Historically informed digital reconstruction of the Roman theatre of Verona. Unveiling the acoustics of the original shape'. *Applied acoustic* 185, 1-18.

- Verzár Bass, M. 1990. 'I teatri nell'Italia settentrionale', in *La Città nell'Italia settentrionale in età romana. Morfologia, strutture e funzionamento dei centri urbani delle Regiones X e XI*, 411-440. Rome: École Française de Rome.
- Vicci, R. 2019. 'Ricostruzioni digitali per la conoscenza e la valorizzazione dei teatri antichi: usi, significati, questioni aperte', in *Indagini archeologiche e ricostruzioni digitali per lo studio degli spazi teatrali greci e romani. Visioni e prospettive*, edited by M. Limoncelli, F. Sacchi, R. Vicci, 83-148. Milano: Educatt.
- Wieseler, F. 1851. *Theatergebäude und Denkmäler des Bühnenwesens bei den Griechen und Römern*. Göttingen: Vandenhoech & Ruprecht.