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History of the development of theater architecture: (5th century BC – beginning of the 20th century)

Abstract. *The article analyzes the stages of formation and development of theater architecture (from antiquity to 1900) in accordance with the evolution of culture,*



historical, social and economic development of human society. A description of the technologies of the theater building of different eras, its design and construction norms are presented. The authors made an attempt to explain the evolution of architectural styles of theater buildings from ancient times to modern times. It helps to understand the influence of cultural, technological and social factors on architectural decisions. The impact of the development of architectural styles in the construction of theaters of different eras on cultural heritage is also considered. The authors emphasize the need for a comprehensive coverage of the importance of considering the architectural features of theater buildings as part of the cultural heritage of various peoples and eras. For this purpose, the authors reviewed architectural masterpieces that have become symbols of their cities or countries. The authors separately considered the issue of technical progress in the construction of theaters at different times. This part of the article is devoted to explaining the technological innovations that influenced theater architecture, such as improved acoustics, lighting, and construction methods. Also, the authors of the article reviewed modern trends in the use of materials and energy-efficient solutions. The article analyzes the relationship between the development of theater architecture and social aspects, such as changes in audience tastes, the role of theater in society, and the reflection of political and cultural trends in buildings. The authors of the article attempted to determine the influence of theater architecture on modern architecture and society. In particular, an overview of the influence of the heritage of outstanding architects of theater buildings and their contribution to the development of architecture in general is made. The article shows that the expansion of the typological structure of the architecture of various theaters created the prerequisites for a variety of compositional schemes and a fundamentally different presentation of architectural tasks. Different city-building conditions, typological foundations and individual characteristics of the theater led to the appearance of new buildings that contrast in their structure, style and means of artistic expression. Historical experience shows that theater architecture is as inexhaustible as theater art, as inexhaustible and complex multi-meaning concept of theater.

Keywords: theater architecture; art; scene; the art of architecture; culture

Introduction.

Theater, like other forms of art, reflects its time, human environment, social structure and needs of society (Pylypchuk, O. Ya., Strelko, & Pylypchuk, O. O., 2021; Pylypchuk, O. Ya., Strelko, Korobchenko, & Pylypchuk, O. O., 2022). After all, theatrical art has found its supporters since ancient times (Amoruso, 2023; Tsagareli, 2022; Mastrothanas & Grammatas, 2022). Over the centuries, new genres and new roles of actors appeared, the fashion for performances changed, but at all times the theater remained one of the most fascinating spectacles. Therefore, the performance with the participation of talented performers became a real event.

Throughout the history of the stage, artists, directors and architects sought to create new forms of theatrical space. At each stage of historical development, new

proposals were developed, which often rejected established traditions, expressed a principled view of the architecture of the stage and hall, and formed a new theater architecture (Proskuryakov, Bohdanova, Kopylyak, Proskuriakov, & Klymko, 2022; Gray, 2022; Paine, 2023).

In general, the development of theater architecture represents an amazingly rich picture. Different artistic styles and systems, methods of decorative design, typological organization of space are beautifully intertwined, erasing chronological boundaries. Progressive currents overcome the resistance of traditions. The complex and contradictory evolution of theater architecture is closely connected not only with technical progress, but also with general trends in the development of theatrical art (Proskuryakov, Ivanov-Kostetskyi, Bohdanova, Kopylyak, & Gumennyk, 2020; Sandu et al., 2021; Haberlandová & Křišteková, 2023).

The architecture of the modern theater is the result of a long and complex path of theater development throughout its history. Its character and variety have always been determined by the artistic tasks that the theater set before itself. All this can be traced to the basic stages of the development of the theater stage.

Today, the individuality of new theater buildings is formed not only by the means of architectural composition, but also by penetrating the nature of theatrical art, which gives rise to new options for the structure of the building, the composition of its premises, the contents of the halls, and the construction of the theater space. Today, thanks to the systematic sequence of work in the field of scenography and theater architecture, it was possible to overcome a number of stereotypes and dogmas that determined the uniformity of the theater hall, the construction of the stage, the auditorium, the composition and composition of the main premises. Alternatives have disappeared: a theater of mass action or a chamber theater, a tiered hall or a single amphitheater, one hall or several.

The expansion of the typological structure of theater architecture created the prerequisites for a variety of compositional schemes and a fundamentally different presentation of architectural tasks. Different construction conditions, typological foundations and individual characteristics of the theater led to the appearance of new buildings contrasting in their structure, style and means of artistic influence.

History shows that theater architecture is as inexhaustible as theater art, as is the theater's inexhaustible complex significance.

Many scientists and architects from different countries and eras were engaged in researching the history of theater architecture (Como, Smeragliuolo Perrotta, Talenti, & Teodosio, 2018; Muecke, 2023; Alvarez-Morales et al., 2023).

One of the first prominent researchers who made a significant contribution to this field should be mentioned Vitruvius (Marcus Vitruvius Pollio) – an ancient Roman architect and engineer, the author of the treatise "De architectura" (On architecture), in which he described the principles of building theaters and other public building (Bianco, 2023; Anderson, 2023; Cigola & Fang, 2016).

The works of Vitruvius, in particular his treatise "De Architectura" (On Architecture), are of great importance for understanding the history of theater architecture for several reasons. "De Architectura" is one of the few surviving written sources that describes in detail the architectural principles and practices of antiquity. Vitruvius provides valuable information about the design, construction techniques, and materials used in Roman theaters (Figure 1).

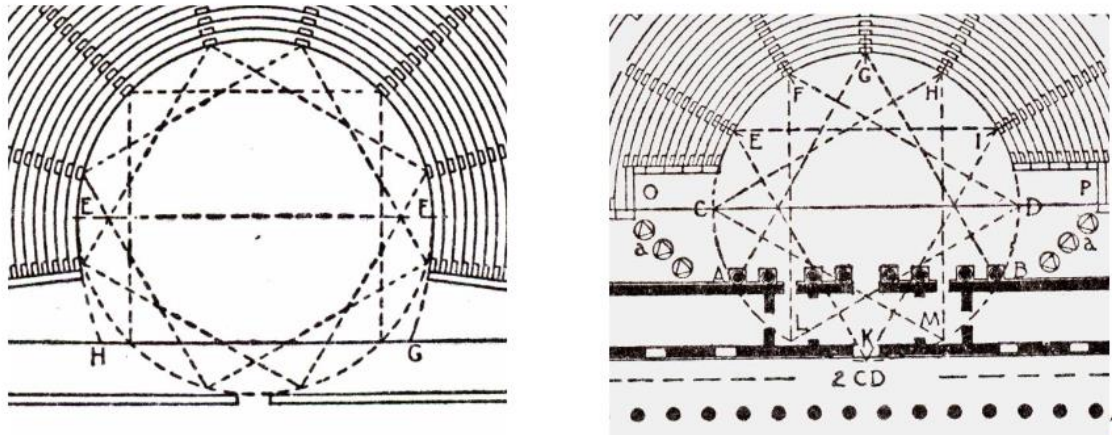


Figure 1. 1- Vitruvius geometrical lay out of the Greek theatre 2- Vitruvius geometrical lay out of the Roman theatre (Haddad & Akasheh, 2006, p. 4).

Vitruvius developed and described the standards and principles that apply to the construction of theaters, such as proportions, acoustics, layout, and decor. These principles became the basis for architectural theory for many centuries to come. In his work, Vitruvius pays particular attention to the importance of acoustics in theaters (Figure 2).

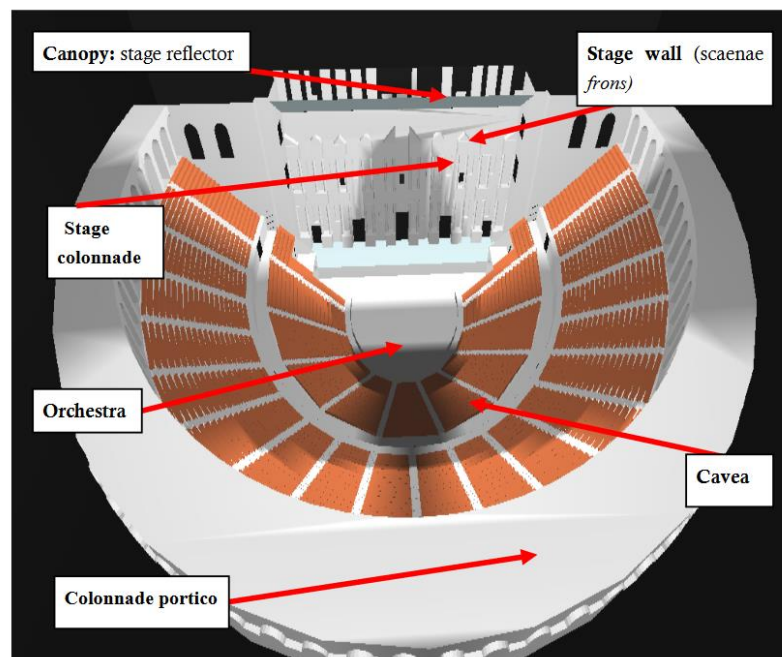


Figure 2. The main architectural and acoustical elements of a typical open-air Roman theatre according to Vitruvius and acoustic simulation (Haddad, 2008).

It describes how theater spaces should be designed to ensure optimal sound distribution. This includes recommendations for the shape of the hall, the use of certain materials and the placement of seats for the audience. Vitruvius emphasizes that theater architecture should be not only aesthetically attractive, but also functional. His recommendations concern the organization of the space, convenience for the audience and actors, as well as security.

Vitruvius' work was revived and studied during the Renaissance, greatly influencing architects of the time such as Leon Battista Alberti (Carnevali, 2022; Muecke, 2023; Di Stefano, 2021) and Andrea Palladio (Solís Rebolledo & Cueto Ruiz-Funes, 2020; Loi, 2022; Murphy et al., 2021). Their works and theater buildings reflect Vitruvian principles (Figure 3).

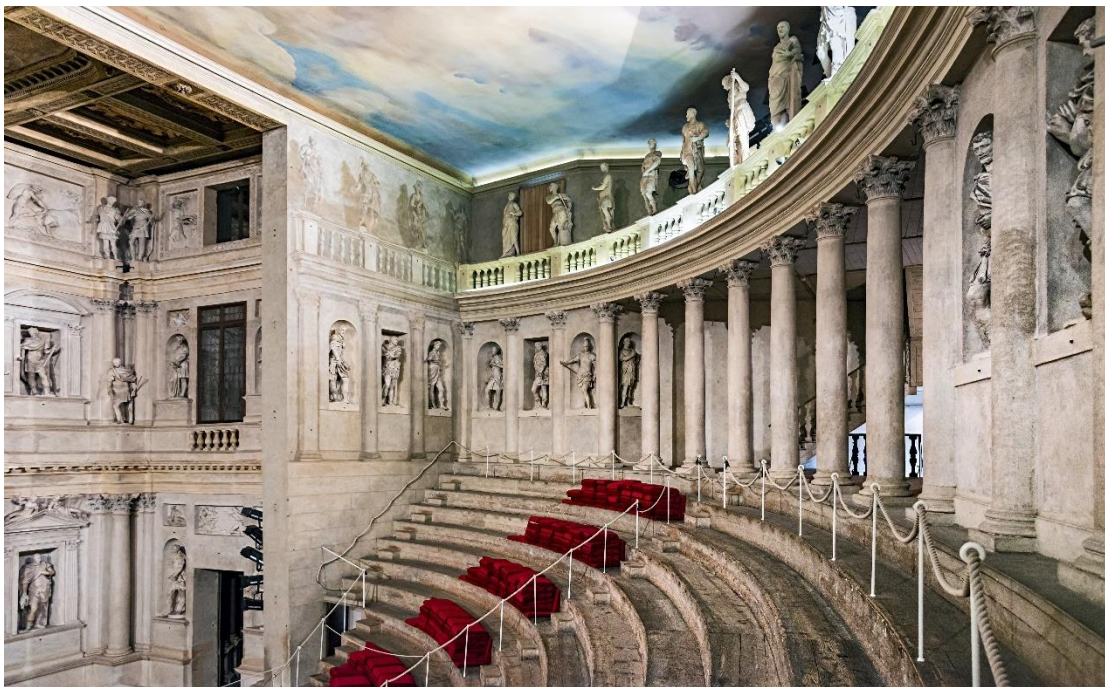


Figure 3. Interior of Teatro Olimpico (Vicenza) – Gradinata (Descouens, 2016).

Vitruvius provides a context for understanding the development of Roman architecture and urban infrastructure. His descriptions include not only technical details, but also cultural, social and political aspects, making his works a valuable historical source. "De Architectura" was often used as a textbook on architecture in medieval and Renaissance academies. Vitruvius systematized the knowledge of his era and passed it on to subsequent generations of architects and builders. Due to these aspects, the works of Vitruvius are fundamental for understanding not only the architecture of theaters, but also the development of architecture as a whole. His treatise "De Architectura" remains an important source of knowledge for modern researchers and practitioners in the field of architecture.

The work "European literature and the Latin Middle Ages" by Ernst Robert Curtius (Ernst Robert Curtius) is a broad and detailed study of the literary and cultural

traditions of medieval Europe. Curtius analyzes the development of Latin literature and its influence on European culture, covering the period from the fall of the Roman Empire to the beginning of the Renaissance. Although the main focus of Curtius in this work is on literature and culture, his work is also of some importance for understanding the development of theater buildings in the Middle Ages (Rotger, 2023; Huber-Rebenich, 2022; Grabócz, 2022). Curtius provides the broad cultural context in which medieval literature developed, including theatrical performances. His analysis helps to understand how literary and theatrical traditions influenced the architecture of theater buildings. It examines the intertextual connections between different literary works and their stage productions, which can provide information about the spatial organization of medieval theater buildings. Curtius analyzes the symbolism and rituals that were important in medieval culture. This can shed light on how theater spaces were used for ritual and symbolic purposes, which influenced their architectural design. In his work, Curtius explores the aesthetic principles that governed medieval culture. This includes an analysis of how theatrical performances influenced the architecture and design of stage spaces. Curtius' work "European Literature and the Latin Middle Ages" became the foundation for many researchers who study medieval culture, literature and architecture. It provided a deep understanding of cultural processes and traditions that influenced the development of theater buildings. Although Curtius did not focus exclusively on theater architecture, his work provided an important context and conceptual framework for understanding the cultural and literary factors that shaped medieval theater architecture.

Among the following researchers, whose works made a significant contribution to the study of the history of theater architecture, Nikolaus Pevsner should be mentioned, who made a significant contribution to the study of the architecture of Great Britain. Pevsner is known for his multi-volume work "The Buildings of England", which became fundamental for the study of the architectural heritage of England (Hultzs, 2014; Engel, 2015). "The Buildings of England" is a series of books consisting of more than 40 volumes and covering detailed descriptions of architectural structures in each English county. This work was published from 1951 to 1974 and is still an important source of information for architectural historians, restorers and architects. Although "The Buildings of England" covers a wide range of architectural structures, including churches, castles, houses and public buildings, it also contains information on theatres. Pevsner thoroughly documented and classified theater buildings in each county, providing information on their architectural styles, construction history, and design features. This includes a description of the exterior, interior layout and decor elements. Pevsner provides a historical context for each building, including the theatres, allowing a better understanding of how these structures fit into the overall development of architecture and urban infrastructure in England. In his work, Pevsner explores the evolution of architectural styles, including those used in theater buildings. It helps to understand how tastes and technology have changed over the centuries and how this has been reflected in the design of theatres. The

information collected by Pevzner is extremely valuable for the preservation and restoration of historical theaters. His detailed descriptions and analysis help restorers to restore these buildings while respecting their original architecture and historical significance. Pevsner's work "The Buildings of England" can be considered an encyclopedic resource that significantly influenced further research on architecture in Great Britain. His methodological approach to documenting and analyzing architectural structures has become a model for many researchers. Regarding the history of theater architecture, Pevzner provided important data and context that help to understand the development of this architectural form in different historical periods.

Sir John Summerson was one of the most influential British architectural historians of the 20th century. His works cover various aspects of British architecture, from classicism to modernism (Summerson, 1957; 1986; 2003a; 2003b; Summerson & Powers, 2023). Summerson was also a curator at the National Gallery in London and had a significant influence on the study of Britain's architectural heritage. Although known for his extensive research on British architecture, Summerson also made a significant contribution to the understanding of the architectural history of theatres. His work in this field includes several important aspects. Summerson explored the various architectural styles that influenced the design of theaters in Great Britain. He detailed how classical, gothic and baroque elements were adapted for theater buildings. He analyzed how social and cultural changes influenced the development of theater architecture. In particular, he investigated how the growth of the urban population and the development of cultural institutions influenced the construction of new theaters and the modernization of existing ones. Summerson has written about several notable theaters, analyzing their architectural features, construction history, and influence on the further development of theater architecture. His works include analyzes of such famous theaters as the Royal Opera House in Covent Garden and Drury Lane. He explored the contribution of individual architects to the development of theater architecture, particularly such figures as John Vanbrugh and Robert Adam. Summerson analyzed their projects and their influence on the evolution of theater space. Summerson studied how theaters are integrated into urban infrastructure, how they influence urban planning and neighborhood development. He saw theaters as important cultural and social centers shaping the surrounding urban environment.

Among the many works of John Summerson, several are of special importance for understanding the architecture of theaters. The book "Georgian London" examines the development of London during the Georgian era, including the architecture of the theaters of the time (Summerson, 2003b). Summerson analyzes how Georgian architecture influenced the design of theater buildings. "Architecture in Britain, 1530–1830" takes a detailed look at British architecture over three centuries, including the development of theatres (Summerson, 2003a). In "The Architecture of the Eighteenth Century", Summerson examines the architectural achievements of the eighteenth century, including theater buildings and their place in the cultural life of the time (Summerson, 1986).

Sir John Summerson made a significant contribution to understanding the development of theater architecture through his detailed research and analytical approach. His works have become important sources for further researchers and architects studying the history and development of theater buildings in Great Britain. His ability to integrate architectural analysis with cultural and social context has made his works indispensable for understanding not only the architecture of theaters, but also the wider architectural heritage.

The listed researchers, like many others, made a great contribution to the understanding and preservation of the historical heritage of theater architecture, offering a multifaceted view of the evolution of theaters over the centuries.

The purpose of this article, devoted to the history of the development of theater architecture, is multifaceted. Here are some tasks that must be solved to achieve this goal:

1. Coverage: Explanation of the evolution of architectural styles of theater buildings throughout history, from ancient times to modern times. It helps to understand the influence of cultural, technological and social factors on architectural decisions.

2. Cultural heritage: highlighting the importance of theater buildings as part of the cultural heritage of different peoples and eras. An overview of architectural masterpieces that have become symbols of their cities or countries.

3. Technological progress: Explaining the technological innovations that influenced theater architecture, such as improvements in acoustics, lighting, and construction methods. Overview of modern trends in the use of materials and energy-efficient solutions.

4. Social context: Analysis of the relationship between the development of theater architecture and social aspects, such as changes in audience tastes, the role of theater in society, and the reflection of political and cultural trends in buildings.

5. Impact: Determining the impact of theater architecture on modern architecture and society. An overview of the influence of the legacies of prominent architects of theater buildings and their contribution to the development of architecture in general.

Therefore, the purpose of the article is aimed at revealing the history and significance of the development of theater architecture as part of the world's cultural and scientific heritage.

Research Methods.

The study of the history of the architecture of theater buildings required the use of a complex approach when choosing methods, covering various aspects, from the study of architectural styles and construction technologies to the analysis of the socio-cultural context and functional features of theaters. The authors used the historical method, in particular, a chronological analysis was made when studying the development of theater architecture in different historical periods. With the help of stylistic analysis, the identification of architectural styles characteristic of different eras

and their influence on the design of theaters was carried out. Comparative analysis was used to compare different theater buildings to identify common features and unique features. With the help of sociocultural analysis, the role of theaters in society is investigated. In particular, the impact of cultural events and trends on the development of theater architecture was investigated.

The study of the history of the architecture of theater buildings is a multifaceted field that requires the integration of various methods and approaches. The use of historical, architectural, sociocultural, and interdisciplinary approaches allowed the authors to get a certain idea about the development, functioning, and influence of theater buildings in different historical periods.

The Main Stages of the Development of Theater Architecture. Ancient Greece Theater.

Theater construction at that time was carried out on a large scale (Figure 4). Today, it is possible to find more or less preserved ruins of theaters in Athens, Oronos, Argos and a number of smaller cities in Greece. In general, theaters in Ephesus, Aspendos, Priene, etc. have also been preserved in Asia Minor. Today, there are more than 55 ancient theater buildings in Greece. The analysis of their constructions shows that the Greeks borrowed the experience of theater construction from other nations and therefore it is believed that they laid the fundamental foundations of theater architecture for many centuries to come (Nastou & Zerefos, 2023; Amadasi, Bevilacqua, Iannace, & Trematerra, 2023; Balaskas, 2021).

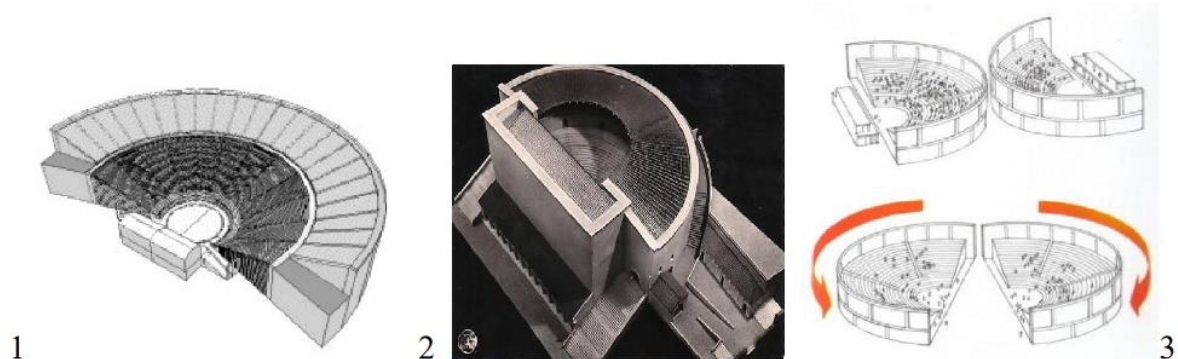


Figure 4. 1- Open air Greek theatre 2- Roman Odeon (roofed theatre) 3- Roman amphitheatre (Haddad & Akasheh, 2006, p. 2).

One of the first theater buildings built in Ancient Greece was the Theater of Dionysus (Figure 5) in Athens (5th century BC) (Sturgeon, 1977). It was named after the temple located opposite. Subsequently, the theater was rebuilt several times - the design of the amphitheater, the dimensions and the location of the stage were changed. In fact, the theater of Dionysus is considered the most typical of Ancient Greece (Poehlmann, 2015). Its architecture is sufficiently fully described in books on the history of the theater.



Figure 5. The Theatre of Dionysus Eleuthereus in Athens (Hartmann, 2017).

The form of the stage dictated its conditions for the composition of the play. At the early stage of theater development, the orchestra was the only playground for both the actor and the chorus. In the Greek theater, when the playwright himself was the only actor performing his play, the flat plane of the orchestra fully satisfied the conditions of the play. The chorus was usually placed around the entire perimeter of the orchestra of the quadrangle, and the actor acted in the middle of the platform. However, later, when Aeschylus introduced a second actor, and then increased them to three and even four, one orchestra was not enough (Sweeney, 2021).

The performance gave complete freedom to the playwrights in choosing the place of action, without oppressing their creativity with the narrow possibilities of the stage, so they easily transferred their characters to various situations that were necessary for expressing the general idea of the performance.

The work of the great dramatists Aeschylus, Sophocles, Euripides, and Aristophanes reflected the most important aspects of the social, political, and spiritual life of the ancient Greeks and created a theater of perfect artistic form. The universal nature of the ancient Greek theater determined the peculiarities of the organization of theatrical performances and the arrangement of buildings.

The decoration of the antique spectacle consisted of flat painted shields. Such aspects of design are considered purely functional – they marked a rather conventional place of action. Various adjustment mechanisms for the movement of actors in the play were of great importance in the production of the play.

Roman Theater.

Of course, the Roman theater, having adopted the traditions and skill of the Greeks, made its own changes in the construction of the theater stage. These changes reflect the new conditions of existence of the theater and the new nature of drama. The disappearance of the choir had a great impact on the shape of the stage. The orchestra began to lose its original meaning already in the 5th century. B.C. in Greece, when more and more acting actors began to appear in the plays, replacing the chorus of the ancient tragedy. That is why in the Roman theater, where the chorus is completely absent, we still find something similar to the Greek orchestra, but it is no longer a playground, but a free area where the audience could be located. The action is completely transferred to the paraskenia – a wide and low rectangular site (Beacham, 1979), surrounded on three sides by capital walls, which were called skena. The shape and frontal placement of the proscenium in relation to the audience made it possible to build mise-en-scenes along the entire front of the playground, developing them also in the depth of the stage.

By the middle of the 1st century BC, and even much later, Roman theaters were temporary wooden structures built for public celebrations and various celebrations. The first monumental constructions made of stone date back to 13 BC, when the famous Theater of Marcellus and Theater of Pompey (see Figure 6) were built in Rome (Packer, Burge, & Gagliardo, 2007).

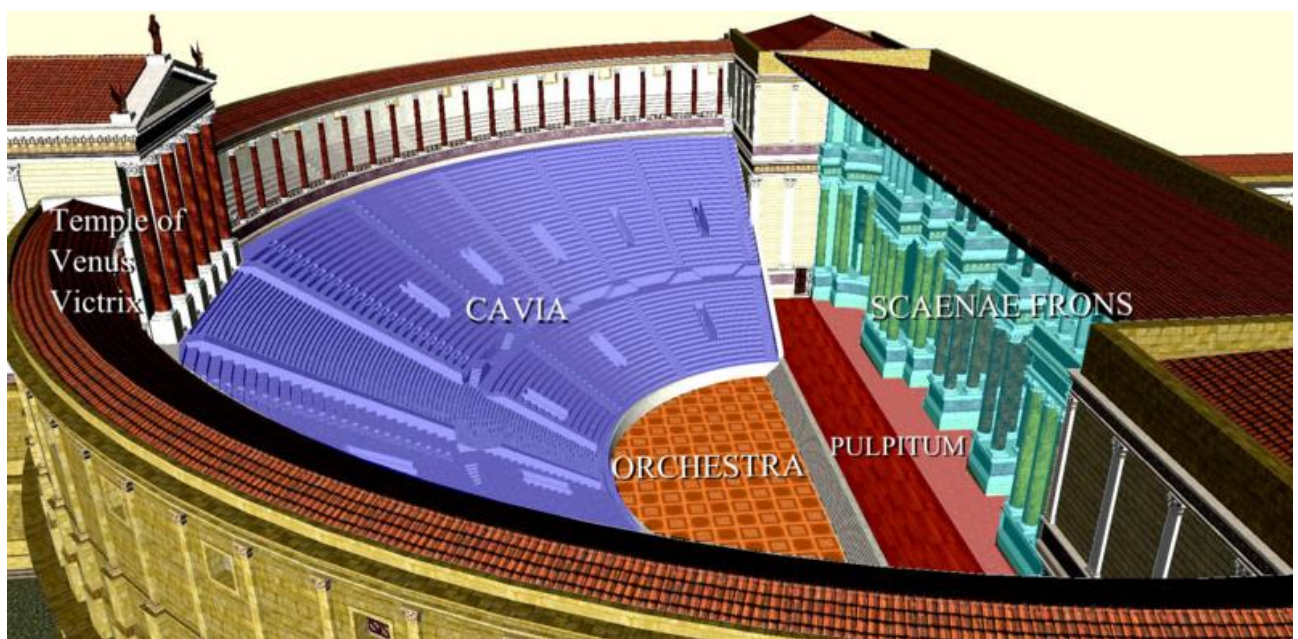


Figure 6. Theatre of Pompey highlighted diagram (Tskhondia, 2012).

The Theater of Marcellus on the banks of the Tiber River in Rome, the construction of which was conceived by Julius Caesar and completed by Octavian Augustus in 12 BC. The theater was 111 meters long and could accommodate 11,000 spectators (Sultanova, 2023). In the Middle Ages, the building was rebuilt into a fortress, over which the palace of the noble Orsini family was built. Unlike Greek theaters, Roman theaters were built on a level site (Picozzi, 2020). The amphitheater was built on stone structures, and the proskenii and skene were monumental multi-story buildings with magnificent architectural framing.

After the completion of the construction of the Theater of Marcellus and the Theater of Pompey in Rome, theater construction became widespread. At this time, a number of Roman theaters of the imperial era could be found in Greece, Spain, Africa and the Middle East. As an example, the most well-preserved ancient Roman theater in Orange (France).

The date of its construction is attributed to the period of the rule of the Roman emperor Octavian Augustus (27 BC – 14 AD). In its form, all the main elements of the ancient Roman theater were embodied: fireplace benches placed in a semicircle for spectators - an amphitheater; a semicircular platform, which used to be used for performances by actors, a choir and musicians – an orchestra; behind it rises a rectangular screen (today's scene); finally, the space of the stage is covered by a stone wall – proskenii – the height of which was 37 meters, and the length – 103 meters (Ros, 1996). Compared to Greek theaters, the architecture of this wall is much richer. The side and central walls were covered with three tiers of Corinthian columns, between which there were statues in niches. The playground was raised above the level of the orchestra by 1.65 m. Sandwiched between the side walls of the skene and covered by a decorative ceiling, it had quite impressive dimensions – 61.12×9.30 m. The overlapping of the skene by the ceiling is evidenced by the grooves made in the upper part of the wall. They served as supports for the cantilever beams that supported the hard and soft ceiling.

Indoor theaters also existed in Greece – they were called odeons (Ciaburro, Iannace, Lombardi, & Trematerra, 2020). However, they were not intended for showing performances to the general public, but for rehearsals and training. The overlap of the stage is attributed to the theater of Ancient Rome. Many sources testify to the overlapping of not only the stage part of the theater, but also the entire amphitheater. Awnings in theaters served for the convenience of the audience, protected them from direct sunlight, wind and rain. The arrangement of the porticos also had a military purpose – firewood was stored here, which was necessary during the siege of the city by the enemy.

The curtain first appeared in the Roman theater. It rose from under the stage, for which a special slot was arranged in its front part. The presence of the curtain indicates that the nature of the drama required such decorative items that could not be quickly and imperceptibly replaced during the performance. Behind the curtain, the periacts returned – triangular prisms that carried three different decorations on their faces, the

objects of props were changed, platforms were extended or rolled away, etc. Performing all these operations in front of an audience of thousands did not allow the aesthetics of the theatrical performance, which was changing.

Thus, it is possible to see that the influence of the ancient theater on the entire subsequent history of European theatrical culture is enormous. Many directors, artists and architects of different countries have repeatedly turned to that improved architectural form, which was created by the Greeks and improved over the course of a whole millennium. Functionality, harmonious perfection and high artistic taste were manifested in the simple and ordinary form of the amphitheater and the open stage. There is no doubt that for a long time the theater will turn to the experience of ancient architects.

Middle Ages Theater.

The riches of the ancient world were not immediately revealed to the people of the Middle Ages: theatrical art was so forgotten that it left behind such vague ideas that, for example, poems with a good beginning and a bad end were called tragedy, and comedy – with a sad beginning and a good end. Initially, in the Middle Ages, it was believed that the ancient plays they found were performed by one person.

Of course, the heritage of ancient culture has been partially preserved. However, the language of educated people – Latin – was not understandable to the barbarian conquerors. The culture of Europe was now increasingly influenced by the Christian religion, which gradually took over people's feelings.

After the fall of the Roman Empire, the revival of the theater began in the 9th century, when the prevailing Christianity introduced theatrical performances in church ceremonies. Staging of Gospel episodes led to the emergence of a special theatrical genre – liturgical drama. For the first time in history, theatrical performances began to take place in a closed room – in a church.

Church Theater Technique. The architectural features of the church determined the forms of the stage space (Girón, Álvarez-Corbacho, & Zamarreño, 2020). At first, the action of the drama developed on a limited platform – near *the altar*. Therefore, *the central nave* of the building, *the chancel*, *the narthex*, and *the preacher's pulpit* began to be used. The most important moments of the drama were played out in the middle of the building.

In the 12th century the so-called simultaneous design principle begins to take shape. Simultaneous decorations are stationary decorations installed in advance on the playground in a certain sequence. The performer's transition from one scenery to another meant a change of place of action. By this time, the action of the drama was already played out on the entire site of the church, for which other rooms were also used. In each of them there were decorations of individual episodes, which were hidden by curtains. At the right moment, these curtains were opened, revealing this or that place of action.

The arrangement of performances required a lot of attention to the artistic side of the performance. Objects of the church ritual began to be replaced by special props. The campaigning and propagandistic character of the church ritual demanded an increase in spectacle. Therefore, a special place in the performance is occupied by various effects. Mechanical beasts and mythical monsters are depicted, the technique of flying over the stage and effective lighting were actively developed.

The crypt, which was located under the church, was used for the effect of the appearance of characters from the ground, and also meant the entrance to "hell". The dome, which was located in the center of the building, served to raise and lower decorative devices along with the role of Christ and angels. Thus, the lower stage (the crypt), the actual stage (the floor level of the church, or a special platform) and the upper stage (the dome) were used in the church theater.

An important role was given to lighting effects. Hundreds of candles and lamps illuminated the scenery and the performers, and they were witnessed simultaneously with the help of a kind of Bickford cord. Of course, at that time all lighting effects were made with the help of ordinary fire.

The church theater existed for several centuries. But along with performances in the church premises, new types and genres of theater were developed. Already at the beginning of the 12th century the theater first appears on the streets and squares of cities. At that time, a new type of theater was born – street theater (Wang, 2020).

Street Theater. The exit of the theater from the closed space of the church determined not only other conditions for staging the performance, but also new genres. The most popular was the mystery – a multi-day presentation on biblical topics. The founder of this genre can be considered the "Gonfalone" society, which appeared in Rome in 1265. And in 1402, another society "Brotherhood of the Lord's Passion" was founded in Paris for this purpose (Greer, 2000). This defined the three-story structure of the stage. "Hell" was located on the first floor of the stage, unseen by the audience, on the second – the main place of action of the performance, and on some elevation "heaven" was depicted. Thus, only the two upper stages were open to the audience, and the lower one, like a "hold" in a modern theater, served for technical purposes. The presence of this kind of hold made it possible to equip the main stage with trapdoors, etc. The most common technique was the principle of placing separate fragments that marked this or that place of action. So, a gilded chair meant a palace, a part of a stone wall with barred windows – a prison, a cross – Calvary, the place of Christ's crucifixion, etc.

In the era of the Middle Ages and the Early Renaissance, stage platforms and places for the audience were built specifically and did not have a uniform form. During the 14th and 16th centuries, small amphitheatres were built in France and England and some other European countries. In some cases, arenas of Roman circuses were used. The so-called *pageants* became the most popular in England. These are peculiar pods that had a two-tier structure: the upper one was a stage, and the lower one served as a place for actors to change clothes.

In general, the medieval mystery was played out on three types of platforms: circular, frontal (conversational) and mobile. The ring version consisted of a high ring-shaped platform, where the action took place on two levels – on the platform and the area of land that was inside it. The front version consisted of a rectangular platform – decorations of the platform with gazebos - decorations of the palace, paradise, purgatory, etc. Mobile – underwater, on which the scenery of one of the episodes of the mystery was set: folk farces were performed on small platforms that rose to the height of human height.

In the middle of the 16th century the church and royal authorities finally banned the performance of the mystery, as the comedic and critical elements of the performance began to supplant the religious direction of the performance. Mystery as a genre of theatrical art was dying, yielding to a new theater – Renaissance drama. In general, the church and secular theater of the Middle Ages did not leave many monuments of theater architecture and various iconographic material. And yet their experience did not disappear without a trace. He nourished not only the Renaissance theater, but also had a significant impact on the development of the theatrical art of later times.

The birth of the "box scene". Information about the arrangement of the Renaissance theater and the early Baroque theater is extremely inaccurate, few and sometimes contradictory. The theater buildings were not preserved either, as they were wooden structures that quickly collapsed or burned during a fire. The first known mention of the construction of the theater dates back to the end of the 15th century. Theatrical performances of the end of the 15th and the first half of the 16th centuries did not have a systematic character. They were given mainly on the occasion of some court holiday. Stage platforms and places for spectators were formed either in one of the halls of the ducal castle, or in the courtyard of a luxurious palace. Theatrical architecture of that time was formed under the powerful influence of the ancient theater, on the one hand, and the practice of staging mystery performances, on the other.

Ancient traditions were most vividly manifested in the composition of spectator cities – in the form of a semicircular amphitheater. The amphitheater form made it possible to solve the problem most advantageously – the supremacy of the location of princely seats. As in the ancient theater, princely seats were installed on the orchestra in the center of the hall, on some elevation. The steps of the amphitheater, on which the courtiers and guests were accommodated, surrounded the princely seats with a steep bend. The architect and artist Sebastiano Serlio (1457–1552) gave the most complete description of the scene of the Italian theater, its lighting and the principles of theatrical perspective in his work *"Regole generali di architettura"* (1545) (Mohler, 2021). In his book, Serlio summarized the experience accumulated by practitioners of the Renaissance theater, defined the basic rules for building a stage and creating the external form of a performance. According to the drawing and description of Serlio amphitheater had 14 steps of the same width and the last 15th – much larger. The

semicircular amphitheater covered the orchestra, which repeated the shape of the orchestra of the Roman theater. The first row of seats, which is located at the level of the orchestra, consisted of seats for the highest nobility, higher – on the steps of the amphitheater – there were seats for noble ladies and gentlemen. The uppermost and widest step was intended for the courtiers. Thus, the rank principle of distribution of audience seats was already manifested here. The semicircular orchestra platform is not only a tribute to ancient traditions, but also an attempt to separate the stage from the auditorium in order to create a great artistic effect.

S. Serlio indicates the scenes and scenery of three types of tragic, comic and satire. Thus, the decorative design of the Renaissance theater was based on the principle of the immutability of the scenery, which was determined by the genre of the performance. A special place in the history of the theater of the Italian Renaissance is occupied by the Teatro Olimpico in Vicenza (Italy), a typical academic theater that recreates a model of Roman theater architecture in a closed room (Menta, 2023). The first theater building, built of stone and preserved to this day, is an excellent example of theater architecture, which is organically combined in one space of the auditorium and the stage.

The amphitheater, elliptical in plan, closely adjoined the portal wall of the stage, covering a small platform – the orchestra – in the middle part of the hall. The scene was an open square of rectangular shape, bounded on three sides by decorative palace-type walls. Three arches are cut into the central wall, behind which is placed an inclined part of the stage with decorations installed on it. The side walls have low openings that connect the open stage with the backstage areas. In general, the composition of the Roman theater is preserved here with three classical exits in the center and two side exits, which replace Greek travesties. This theater completes the history of the Renaissance stage, which at the end of the 16th century. underwent significant changes under the influence of the rapidly developing Baroque theater.

The emergence of a theater with changing scenery. The new requirements for setting up the stage and the principles of creating the external form of the performance were prepared by extensive experience in staging interludes and with the development of opera and ballet. The new genre demanded an enchanting show, saturated with various stage effects, numerous changes of scenery. And for this, completely new stage conditions, different techniques and new means of creating the external form of the performance are needed. The transition of the theater to a closed room, equipped with a stationary stage, on which all the necessary devices and mechanisms for the movement of the scenery and the implementation of effects could be installed, was also of great importance for the further development of the stage and decorative art.

The production of interludes, and even more so opera performances, required a much larger stage space. The top of the stage received a significant development. The scenic "sky" was not depicted as an ordinary vault, but consisted of several rows of hard surfaces that had a concave profile. Behind them were placed lamps that illuminated the surfaces of individual parts of the "sky", as well as clouds cut out of

plywood that could move along a cable stretched across the stage. This method of masking the top of the stage is encountered for the first time and is actually considered the progenitor of theater pods, just as upper lights are the first soffit. The use of parapets and continuous clouds indicate a new step in the technological development of the overstage space.

The search for means of changing the scenery in the performance led to the abandonment of the relief perspective and its replacement with a pictorial one. The first examples of changing the scenery identified three main ways of changing the scenery design: masking the building scenery with scenic backdrops; retractable hard decorations; changing scenery with the help of a thelars. Thelars, or from the Greek, periacts – three-sided prisms covered with a painted canvas and placed according to the plans of the scene.

The Italian scene at the end of the first quarter of the 17th century. takes on the real features of the classical stage – the box, which dominated for several centuries and today is the most common form of the stage. The portal arch sharply demarcates the space of the stage and the space of the auditorium. A drop curtain was placed behind it, which appeared before the audience only at the beginning and at the end of the performance. In front of the stage in the plane of the portal, there was the so-called front moat – a prototype of the orchestra pit, separated from the auditorium by a deaf barrier. The front moat contributed to the enhancement of the stage illusion, distancing the audience from the stage, there were places where the falling curtain could fall.

Lamps were attached to the inner wall of the barrier, which served as a modern ramp. The stage ended with a rear ditch, a long hatch for effects and masking the lines of contact of the rear with the stage. Retractable scenery walls, thelars could not fully meet the growing needs of an opera performance, as they had limited possibilities in the number of scenery changes. The theater aspired to such a system that would allow for sudden changes of a larger number of paintings using beautiful scenic scenery that created a high degree of illusion. In the twenties of the 17th century. such was the backstage technique. This scene combined a new system of performance design and new, specially designed stage equipment.

The name of the inventor of the swing system has not yet been established, but there is every reason to believe that one of the authors of the new technique was the architect Giovanni Battista Aleotti (1545–1630), the builder of the Duke Farnese Theater in Parma (Clemente, 2022a). The Farnese Theater went down in history as the first theater equipped with stationary stage machines. The architecture of this building is extremely controversial. On the one hand, there is a wonderful stage with large reserve platforms on the sides, a wide barrier and the latest stage equipment. On the other hand, there is an auditorium that repeated ancient traditions with very unfavorable ancient data.

Moving the scenery across the entire width of the stage is necessary for a number of stage effects, and mainly for changing scenic background. Theater scene of the 17th century had not yet acquired grate arrangements, a system of decorative trays, did not

have sufficient height for this reserve, therefore, when completing the composition, the backstage backs could be changed only with the help of rocking machines, which were rolled to the sides or, in some cases, wound on wooden scales fixed in vertical part of the stage box.

The stage-box, stage machines, flat scenic scenery, which illusorily conveyed the volume and space, are becoming widespread in European countries at this time. The further development of the stage and its techniques took place together with the development of the opera genre, and took place under the sign of the expansion of editing possibilities, increasing the variety and complexity of effects. At this time, artistic techniques were developed, with the use of theatrical painting, special machines, preserving the principle of illusion. Theatrical effects acquired a new quality - artistic expressiveness and stylistic unity with the rest of the performance components.

Starting from the middle of the 17th century, strict rules of the unity of the place are reflected in theatrical and decorative art. On the stage of the drama theater, the principle of stationary scenery is once again confirmed. The design of the performance is deprived of the signs of the era, the exact place of action. Pompous palace halls created by the hands of painters fill the European scene and dominate there for almost a century and a half.

Tier Theater. 17th century in the history of the theater is characterized not only by fundamental transformations in the field of modern technology, but also by the achievements of theater architecture. The formation of public theaters led to new requirements for accommodating the audience and for reforming the theater space. The first public theaters began to appear in the last quarter of the 16th century. In 1576, the "Theatre" building was built in London (Fleay, 1882). After this theater, a number of other buildings were built on the bank of the Thames, including the famous "Swan" and "Globe".

The famous London Globe theater, which was a typical English theater of the beginning of the 17th century, had the shape of a Roman amphitheater without a roof. Founded in 1599, this theater is famous for the fact that one of its co-owners was Shakespeare, most of the dramatist's plays premiered on the Globe stage. The theater stage adjoined the rear part of the building, and a stage platform ("gallery") rose above its deep part. A "house" was located even higher – a building with one or two windows. There were no decorations here, instead, special signs were placed that indicated the time and place of this scene. The auditorium accommodated from 1,200 to 3,000 spectators. At the same time, there were no seats for ordinary people: they were crowded in the parterre, standing on the dirt floor. On the inner side of the wall, there were boxes for the aristocracy, and above them was a gallery for wealthy burghers. The richest and noblest spectators sat on the sides of the stage, on portable three-legged stools. Only the foundation remained from the first historic building, which is now preserved. The modern building of the theater is an exact reconstruction of the structure

at a distance of 200 m from the previous place. The building has a round shape, built of old oak, and the roof is covered with straw (see Figure 7).

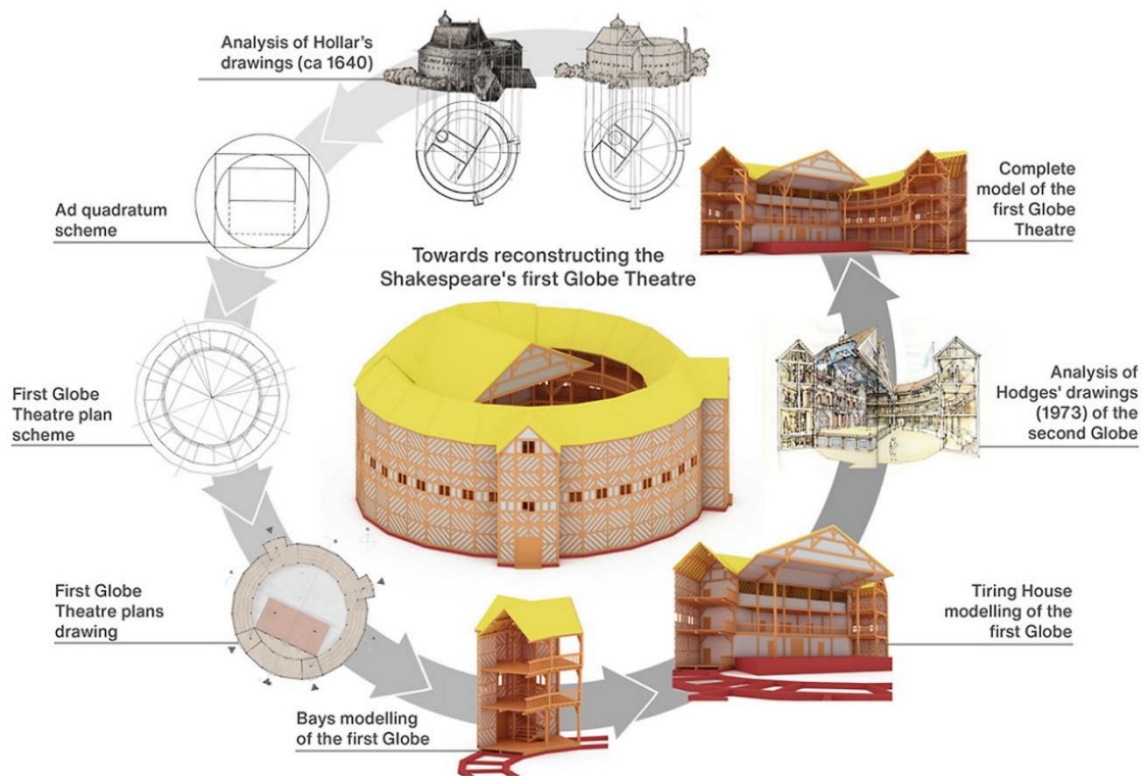


Figure 7. Towards reconstructing the Shakespeare's first Globe Theatre: A virtual model for research and development (Croce, Leccese, Mordagà, & Salvadori, 2022).

English theaters are the prototype of tiered or rank theater. The small amphitheatres of the court theaters could not satisfy the interest in theatrical art among the bourgeois-democratic layers of the population. The task was to develop new principles of layout of the auditorium, which provided, on the one hand, for a clear division of the audience according to social characteristics, and on the other hand, for the placement of the maximum number of seats in the minimum space. The tiers acquired their final appearance in the theater "San Cassiano", built in Venice in 1637 (Colvin, 2004). It was the first theater that was open to the general public. At the end of the 17th century Venice became the opera capital of the world. The theater "San Cassiano" gave performances until 1807, when it burned to the ground.

Initially, tiered theaters were open balconies placed one above the other in three floors. In subsequent buildings, the differentiation of the public not only by social status, but also by family name led to the division of balconies into separate, isolated boxes. A so-called *avanloge* was added to each box – a small salon located on the other side of the corridor that covered the audience hall. Later, in some theaters, both rooms were closely adjacent to each other. The division of audience seats into separate, independent cells freed the theater from the need to build larger foyers and aisles. Since the boxes were reserved by families, the life of the audience during the performance

took place in these closed rooms. There they met acquaintances and exchanged impressions. The tiered system sharply differentiated the quality of individual seats in terms of stage visibility. So, for example, the maximum viewing angle in the Vienna Court Theater along the middle axis was equal to 31 degrees, and along the axis of visibility from the upper box, which was adjacent to the portal of the stage, it increased to 44 degrees. Thus, the audience sitting in the upper side boxes could see only the first plan of the stage, and even then, in a strong distortion. As for the decorations, their prospective construction was calculated from the central point of the auditorium.

The first tiered theaters were intended for opera. The main concern of the architect was not the visibility of the stage, but the acoustics. The acoustic data of the theater largely depends on the shape of the auditorium. After numerous searches, theoretical calculations and practical tests, a type of construction in the form of a truncated ellipse or horseshoe was developed, which was called "Italian curve". The most advanced manifestation of the "Italian curve" was in the auditorium of the Milan theater "La Scala", built by G. Piermarini in 1776 (Clemente, 2022b).

By the number of seats, it was the largest theater in Europe. The ground floor and 6 rows, divided into 200 boxes, could accommodate 3,000 spectators. Despite the huge size of the hall, its acoustics were unmatched. The wide opening of the portal, the side parts of which merged with the barriers of the boxes, also contributed to the creation of the best acoustics. And this theater could not overcome the contradictions that are present in the combination of a deep box with a vertical stage of seating. Good visibility of the stage was ensured only from the central part of the hall. Paying the main attention to acoustics, planning decisions of the stage, Italian architects sparingly and inexpressively developed the internal architecture of buildings. In contrast to the Italians, the French architects strove for an unusual appearance and richness of architectural decor, for the maximum increase of ceremonial spaces for the public.

The origins of the French tiered theater can be found in the first theater building built in Paris: the rectangular hall of the "Hôtel de Bourgogne" was surrounded by a tier of boxes. In the second half of the 18th century the rectangular shape of the auditorium, characteristic of France, is replaced by an elliptical one. The first builder of this type was the architect Jacques-Germain Soufflot, who in 1756 initiated a new stage in the development of French theater architecture with a theater in Lyon (Delledonne, 2022). The theater in Lyon was the first theater built as a separate building, open from all sides. The wide opening of the portal, the shortened auditorium, which approached the circle, and the special pattern of the portal area are characteristic of the French theater.

By the beginning of the next century, the spectrum turned out to be very small and in 1826 it was demolished, and a new Lyon Opera was built in its place. In 1885, the city decided to rebuild the opera house on the same site and a competition was announced. According to the results of the competition, the construction of the theater was entrusted to the outstanding French architect Jean Nouvel (see Figure 8).



Figure 8. L'Opéra National de Lyon (Lyon Opera, n. d.)

The construction was completed in 1903 (Pasler, 2020). The shell of the existing building of 1831 was left - walls, facade and foyer. The total height of the building with 5 underground floors, a depth of 20 meters and a 6-story dome was 62 m, the volume is about 80,000 square meters. m. The auditorium is built in the traditional Italian style, horseshoe-shaped and has 6 tiers of balconies. The capacity of the hall reached 1100 seats.

The development of the classical stage of the French theater is completed by the Grand Opera in Paris, built by Charles Garnier in 1875 (Sealy, 2021). The auditorium with 5 tiers and boxes accommodated 2150 seats. At that time, the stage of the Paris Grand Opera took first place not only in terms of its dimensions, but also in terms of the level of mechanical equipment (see Figure 9). The dimensions of the stage, the classical technique brought to perfection, impressed contemporaries with the wealth of editing possibilities.

Wheeled machines, lifting-convex platforms, extendable beams for lifting scenery from the hold presented wide opportunities for changing scenery and various effects. And today this theater, designed as a monument to the majesty of France, is an impressive sight. French theater has had a strong influence on theater construction in many countries.

In conclusion, it is worth noting that the study of the history of theater architecture is of considerable importance to modern science for several key reasons. The architecture of theaters reflects the cultural, social and political characteristics of the era in which they were built. By studying these structures, we can better understand how aesthetic tastes, technological possibilities, and social structures of society changed. Theaters were often the place of introduction of new architectural and technical solutions.



Figure 9. Auditorium and stage of the Palais Garnier (Ikeda, 2012).

By studying them, one can trace the development of building materials and techniques, as well as innovations such as the acoustic properties of halls and stages (Sukaj et al., 2021; Sanvito, 2021; Till, 2019). Understanding the history of theaters is important for the preservation and restoration of these architectural monuments. This allows to restore their authentic appearance and functions, preserving the historical and cultural heritage for future generations. Theaters often served as centers of public life and had a great influence on the development of cities and society. Studying their architecture helps to understand how they influenced urban planning, public space and social dynamics. The history of theater architecture combines knowledge from various disciplines, such as history, art history, archaeology, cultural studies and even engineering. This creates opportunities for interdisciplinary research and new discoveries at the intersection of different fields of knowledge.

Thus, the study of the history of theater architecture not only helps to better understand the past, but also contributes to the development of modern science, culture and society.

Conclusions.

The article analyzes the stages of formation and development of theater architecture (from antiquity to 1900) in accordance with the evolution of culture, historical, social and economic development of human society.

A description of the technologies of the theater building of different eras, its design and construction norms are presented. The authors made an attempt to explain

the evolution of architectural styles of theater buildings from ancient times to modern times.

It is shown that the expansion of the typological structure of the architecture of various theaters created the prerequisites for a variety of compositional schemes and a fundamentally different setting of architectural tasks. Different town-building conditions, typological foundations and individual characteristics of theaters led to the appearance of new buildings that contrast in their structure, style and means of artistic expression.

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References

- Alvarez-Morales, L., Santos da Rosa, N., Benítez-Aragón, D., Fernández Macías, L., Lazarich, M., & Díaz-Andreu, M. (2023). The Bacinete main shelter: a Prehistoric theatre? *Acoustics*, 5(1), 299–319. <https://doi.org/10.3390/acoustics5010018>
- Amadasi, G., Bevilacqua, A., Iannace, G., & Trematerra, A. (2023). The acoustic characteristics of Hellenistic Morgantina theatre in modern use. *Acoustics*, 5(3), 870–881. <https://doi.org/10.3390/acoustics5030050>
- Amoruso, G. (2023). The Tale of the Roman Theater of Philadelphia, Amman. Representative and experiential methodology of the theatrical space. *Disegnarecon*, 16(31), 15.1–15.10. <https://doi.org/10.20365/disegnarecon.31.2023.15>
- Anderson, D. (2023). Measuring up: The Greek analogies behind Vitruvius' geometry of the body. *Ramus*, 52(2), 121–136. <https://doi.org/10.1017/rmu.2024.3>
- Balaskas, V. (2021). Local involvement in modern Greek revivals of ancient theatres: Delphi and Epidaurus in the inter-war period. *Byzantine and Modern Greek Studies*, 45(1), 75–91. <https://doi.org/10.1017/byz.2020.25>
- Beacham, R. (1979). The development of the Roman stage: a missing link Restored. *Theatre Research International*, 5(1), 37–45. <https://doi.org/10.1017/S0307883300000353>
- Bianco, L. (2023). Architecture, engineering and building science: the contemporary relevance of Vitruvius's De Architectura. *Sustainability*, 15(5), 4150. <https://doi.org/10.3390/su15054150>
- Carnevali, E. (2022). Renaissance domestic affairs on stage: Clizia as Machiavelli's reading of Alberti's On Family. *Forum Italicum*, 56(2), 209–228. <https://doi.org/10.1177/00145858221083880>

- Ciaburro, G., Iannace, G., Lombardi, I., & Trematerra, A. (2020). Acoustic design of ancient buildings: The odea of Pompeii and Posillipo. *Buildings*, 10(12), 224. <https://doi.org/10.3390/buildings10120224>
- Cigola, M., & Fang, Y. (2016). Traces and echoes of De Architectura by Marcus Vitruvius Pollio in the work of Xu Guangqi in 17th century China. *Frontiers of Mechanical Engineering*, 11, 3–11. <https://doi.org/10.1007/s11465-015-0359-5>.
- Clemente, S. (2022a). Theatre as Solidification: Rediscoveries, Interpretations, Inventiones. In *Reconstructing Theatre Architecture: The Developing Process of the Modern Space for the Show* (pp. 51–74). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-030-89968-4_3
- Clemente, S. (2022b). The Evolution of Theatre Features: Urban and Architectural Knots. In *Reconstructing Theatre Architecture: The Developing Process of the Modern Space for the Show* (pp. 129–158). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-030-89968-4_6
- Colvin, S. (2004). Musical Culture and Thought. In B. Becker-Cantarino, A. Richards, B. Becker-Cantarino, F. Lamport, F. Eybl, H. Brandes, ... & W. Wilson (Eds.), *German Literature of the Eighteenth Century: The Enlightenment and Sensibility* (pp. 185–222). Martlesham, Suffolk, England: Boydell and Brewer. <https://doi.org/10.1515/9781571136435-010>
- Como, A., Smeragliuolo Perrotta, L., Talenti, S., & Teodosio, A. (2018). TPI—the Italian popular theatre: An architectural, technological and building experiment of a space in motion. In *6th International Congress on Construction History (6ICCH 2018)*, July 9–13, 2018, Brussels, Belgium (pp. 485–491). Retrieved from <https://hdl.handle.net/11386/4718975>
- Croce, P., Leccese, F., Mordagà, M., & Salvadori, G. (2022). Towards reconstructing the Shakespeare's first Globe Theatre: a virtual model for research and development. *Frontiers of Architectural Research*, 11(6), 1104–1120. <https://doi.org/10.1016/j.foar.2022.05.004>
- Delledonne, N. (2022). From Wagner to Wagner: reminiscences of the Bayreuth Festspielhaus in the reconstruction of the Carlo Felice Opera House in Genoa. *Frontiers of Architectural Research*, 11(5), 917–933. <https://doi.org/10.1016/j.foar.2022.04.001>
- Descouens, D. (2016). *Interior of Teatro Olimpico (Vicenza) – Gradinata*. Retrieved from [https://commons.wikimedia.org/wiki/File:Interior_of_Teatro_Olimpico_\(Vicenza\)_-_Gradinata.jpg](https://commons.wikimedia.org/wiki/File:Interior_of_Teatro_Olimpico_(Vicenza)_-_Gradinata.jpg)
- Di Stefano, E. (2021). Decorum. An ancient idea for everyday aesthetics?. *ESPES*, 10(2), 25–38. <http://dx.doi.org/https%3A//doi.org/10.5281/zenodo.5866405>
- Engel, U. (2015). ‘Fit for its purpose’: Nikolaus Pevsner argues for the modern movement. *Journal of Design History*, 28(1), 15–32. <https://doi.org/10.1093/jdh/epu010>

- Fleay, F. G. (1882). On the History of Theatres in London, from their First Opening in 1576 to their Closing in 1642. *Transactions of the Royal Historical Society*, 10, 114–133. <https://doi.org/10.2307/3678021>
- Girón, S., Álvarez-Corbacho, Á., & Zamarreño, T. (2020). Exploring the acoustics of ancient open-air theatres. *Archives of Acoustics*, 45(2), 181–208 <http://dx.doi.org/10.24425/aoa.2020.132494>
- Grabócz, M. (2022). Mémoire et invariants dans les œuvres de l'histoire musicale européenne, dans la littérature et dans les neurosciences. *Music as Cultural Heritage and Novelty*, 24, 43–55. https://doi.org/10.1007/978-3-031-11146-4_3
- Gray, R. (2022). Theatrical exercises in architectural education to enact and draw social space. *The International Journal of Design Education*, 17(1), 65–78. <https://doi.org/10.18848/2325-128X/CGP/v17i01/65-78>
- Greer, M. R. (2000). A Tale of Three Cities: The Place of the Theatre in Early Modern Madrid, Paris and London. *Bulletin of Hispanic Studies*, 77(1), 391–419. <https://doi.org/10.1080/00074900051082626>
- Haberlandová, K., & Křišteková, L. (2023). Innovations in architecture and the impact of architects' mobility on their application: The case of the new building of the Slovak National Theatre in Bratislava. *Historický časopis (Historical Journal)*, 71(5), 867–894. <https://doi.org/10.31577/histcaso.2023.71.5.6>
- Haddad, N. A. (2008). Reviving the architectural and acoustical theatre heritage: the role of ERATO Project. In *Fifth International Conference of the Center for the Study of Architecture in the Arab Region (CSAAR 2008B): Responsibilities and Opportunities in Architectural Conservation: Theory, Education, and Practice*, November, 2008, 3-5, Amman, Jordan, (pp. 421–434). Retrieved from https://www.researchgate.net/profile/Naif-Haddad/publication/268364356_Reviving_the_Architectural_and_Acoustical_Theatre_Heritage_the_Role_of_ERATO_Project/links/54f86f5a0cf2ccffe9df274a/Reviving-the-Architectural-and-Acoustical-Theatre-Heritage-the-Role-of-ERATO-Project.pdf
- Haddad, N., & Akasheh, T. (2006). Vitruvius and ancient theatres. In *ERATO project Symposium Proceedings*. Retrieved from <https://www.cultech.net/sites/default/files/Vetruvius.pdf>
- Hartmann, N. (2017). *The Theatre of Dionysus Eleuthereus in Athens*. Retrieved from https://commons.wikimedia.org/wiki/File:2007_Greece_Athens_Theatre_of_Dionysus_Eleuthereus.jpg
- Huber-Rebenich, G. (2022). Perennare canendo. Die Vorstellung von der «Dichtung als Verewigung» in den carmina des Baudri von Bourgueil. *Museum helveticum*, 79(1), 137–149. <http://dx.doi.org/10.24894/2673-2963.00053> [in German].
- Hultzs, A. (2014). Architectural history from eye-level: Nikolaus Pevsner's 'Treasure Hunts' in the Architectural Review, 1942. *The Journal of Architecture*, 19(3), 382–401. <https://doi.org/10.1080/13602365.2014.930755>

- Ikeda, N. (2012). *Auditorium and stage of the Palais Garnier*. Retrieved from https://commons.wikimedia.org/wiki/File:Palais_Garnier_auditorium_and_stage.jpg
- Loi, D. (2022). Beautiful (im)perfections are us. *Interactions*, 29(5), 11–12. <https://doi.org/10.1145/3555042>
- Lyon Opera. (n. d.). *For Companies – Opéra national de Lyon*. Retrieved from <https://www.opera-lyon.com/en/espace-entreprises>
- Mastrothanas, K., & Grammatas, T. (2022). Reception of the values of the Aeschylus drama and mnemonic imprints by ancient tragedy spectators. *Open Research Europe*, 2(124), 1–14. <https://doi.org/10.12688/openreseurope.15179.1>
- Menta, E. (2023). How the Teatro Olimpico and the Drottingholm Slottsteater ‘Perform’ Their Pasts. *Theatre Research International*, 48(2), 195–219. <https://doi.org/10.1017/S0307883323000081>
- Mohler, F. (2021). The “Miraculous” Early Modern Scenic Change in Court Theatres and the Venetian Public Opera. *Kronika Zamkowa. Roczniki*, 8(8), 215–234. Retrieved from https://kronika.arxregia.pl/wp-content/uploads/sites/2/2022/10/KZ_2021_11_Mohler_The_Miraculous_Early_Modern_Scenic_Change_in_Court_Theatres_and_the_Venetian_Public_Opera.pdf
- Muecke, F. (2023). The Fama of the Theatre of Pompey between Antiquity and Antiquarianism. *Antichthon*, 57, 158–180. <https://doi.org/10.1017/ann.2023.3>
- Murphy, M., Meegan, E., Keenaghan, G., Chenaux, A., Corns, A., Fai, S., ... & Prizeman, O. (2021). Shape grammar libraries of European classical architectural elements for historic BIM. *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, XLVI-M-1-2021*, 479–486. <https://doi.org/10.5194/isprs-archives-XLVI-M-1-2021-479-2021>
- Nastou, M. P., & Zerefos, S. (2023). Heritage management and sustainability of heritage sites. The case of ancient Greek theatre of Dodoni, Epirus, Greece. *E3S Web of Conferences*, 436, 01007. <https://doi.org/10.1051/e3sconf/202343601007>
- Packer, J. E., Burge, J., & Gagliardo, M. C. (2007). Looking again at Pompey's theater: the 2005 excavation season. *American Journal of Archaeology*, 111(3), 505–522. <https://doi.org/10.3764/aja.111.3.505>
- Paine, A. (2023). Buildings-in-buildings: museological theatres of preservation and display. *arq: Architectural Research Quarterly*, 27(3), 190–208. <https://doi.org/10.1017/S1359135523000295>
- Pasler, J. (2020). Musical Work in the Tunisian Protectorate: Paul Frémaux, Antonin Laffage, and Evolving Colonial Identities. *Revue de Musicologie*, 106(1), 45–88. <https://www.jstor.org/stable/48671228>
- Picozzi, M. G. (2020). Discovery and Modern History of the Richmond Caligula. In P. J. M. Schertz, & B. Frischer (Eds.), *New Studies on the Portrait of Caligula in the Virginia Museum of Fine Arts* (pp. 31–43). Leiden, Netherlands: Brill. https://doi.org/10.1163/9789004417366_005

- Poehlmann, E. (2015). Epicharmus and Aeschylus on Stage in Syracuse in the 5th Century. *Greek and roman musical studies*, 3(1), 137–166. <https://doi.org/10.1163/22129758-12341005>
- Proskuryakov, V., Bohdanova, Y., Kopylyak, I., Proskuriakov, O., & Klymko, Z. (2022). The contribution of Jewish architects to the construction of theatres in Lviv. *American Institute of Physics Conference Series*, 2574(1), 070001. <https://doi.org/10.1063/5.0105235>
- Proskuryakov, V., Ivanov-Kostetskyi, S., Bohdanova, Y., Kopylyak, I., & Gumennyk, I. (2020). Searching the Theatrical Architecture of the Future in the Projects of Lviv Architecture School. *IOP Conference Series: Materials Science and Engineering*, 960(3), 032036. <https://doi.org/10.1088/1757-899X/960/3/032036>
- Pylypchuk, O. Ya., Strelko O. H., Korobchenko, A. A., & Pylypchuk, O. O. (2022). Alfred Russel Wallace about harmony in the Universe (To the 120th anniversary of his work "Man's Place in the Universe"). *Space Science and Technology*, 28(2), 61–68. <https://doi.org/10.15407/knit2022.02.061>
- Pylypchuk, O. Ya., Strelko, O. H., & Pylypchuk, O. O. (2021). Academician V. I. Vernadsky about the originality of life in Space (To the 100th anniversary of his work "The Beginning and Eternity of Life"). *Space Science and Technology*, 27(2), 85–92. <https://doi.org/10.15407/knit2021.02.085>
- Ros, K. E. (1996). The roman theater at Carthage. *American Journal of Archaeology*, 100(3), 449–489. <https://doi.org/10.2307/507025>
- Rotger, N. (2023). Postwar Intellectuals and the concept of European literature: exile, memory, reparation. *Primerjalna Knjizevnost*, 46(3), 157–175. <https://doi.org/10.3986/pkn.v46.i3.09>
- Sandu, I., Orlenko, M., Dyomin, M., Ivashko, O., Ivashko, Y., Lăzăreanu, C. G., ... & Sztabińska-Kałowska, P. (2021). Scientific conservation of the outstanding theaters of the 19th century and their influence on the creation of modern art-space. *International Journal of Conservation Science*, 12(2), 361–390. Retrieved from http://ijcs.ro/public/IJCS-21-28_Sandu.pdf
- Sanvito, P. (2021). Progress of spatial acoustics in the Northern Italian theatres and stage architecture during the Baroque Era. *The Actual Problems of History and Theory of Art*, (11), 681–698. <https://doi.org/10.18688/aa2111-06-55>
- Sealy, P. (2021). Fragments and fragmentary vision in nineteenth-century architectural photographs. *Word & Image*, 37(1), 99–116. <https://doi.org/10.1080/02666286.2020.1866479>
- Solís Rebolledo, G., & Cueto Ruiz-Funes, J. I. D. (2020). Cicero, Vitruvius, Daniele Barbaro and Andrea Palladio: The classical creative process of the inventio-dispositio and the Italian Renaissance's concept of disegno. *Acta poética*, 41(1), 133–156. <https://doi.org/10.19130/iifl.ap.2020.1.869> [in Spanish].
- Sturgeon, M. C. (1977). The reliefs on the theater of Dionysos in Athens. *American Journal of Archaeology*, 81(1), 31–53. <https://doi.org/10.2307/503646>

- Sukaj, S., Bevilacqua, A., Lombardi, I., Capece, A., Buono, M., & Iannace, G. (2021). Acoustic study of the Flegrean Arena: the biggest arena built for the community of Naples. In *2021 Immersive and 3D Audio: from Architecture to Automotive (I3DA)* (pp. 1–6). Bologna, Italy: IEEE. <https://doi.org/10.1109/I3DA48870.2021.9610956>
- Sultanova, M. F. (2023). The formation of art and Architecture of the Ancient Period. *European Journal of Arts*, (1), 22–26. <https://doi.org/10.29013/EJA-23-1-22-26>
- Summerson, J. (1957). Three Elizabethan Architects. *Bulletin of the John Rylands Library*, 40(1), 202–228. <https://doi.org/10.7227/BJRL.40.1.8>
- Summerson, J. (1986). *The Architecture of the Eighteenth Century*. London: Thames & Hudson.
- Summerson, J. (2003a). Architecture in Britain, 1530–1830. In *Reading Architectural History* (pp. 109–121). London: Routledge.
- Summerson, J. (2003b) *Georgian London*. New Haven: Published for the Paul Mellon Centre for Studies in British Art by Yale University Press. Retrieved from https://archive.org/details/georgianlondon0000summ_o6h7/page/n1/mode/2up
- Summerson, J., & Powers, A. (2023). *The classical language of architecture*. London: Thames & Hudson.
- Sweeney, S. (2021). Aeschylus: c. 525 BC–c. 456 BC. In P. F. O'Grady (Ed.), *Meet the Philosophers of Ancient Greece* (pp. 53–57). London: Routledge. <https://doi.org/10.4324/9781315249223>
- Till, R. (2019). Sound archaeology: A study of the acoustics of three world heritage sites, Spanish prehistoric painted caves, Stonehenge, and paphos theatre. *Acoustics*, 1(3), 661–692. <https://doi.org/10.3390/acoustics1030039>
- Tsagareli, T. (2022). Problems of Theatrical art in the XXI century. *Revista ARTA*, 31(2), 84–86. <https://doi.org/10.52603/arta.2022.31-2.12>
- Tskhondia, L. (2012). *Theatre of Pompey highlighted diagram*. Retrieved from https://commons.wikimedia.org/wiki/File:Theatre_of_Pompey_highlighted_diagram.png
- Wang, S. (2020). Transfer from the Church to the Street: Discussion on the Secularization of European Medieval Religious Dramas. In *4th International Conference on Art Studies: Science, Experience, Education (ICASSEE 2020)* (pp. 84–88). Atlantis Press. <https://doi.org/10.2991/assehr.k.200907.015>

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Історія розвитку архітектури театру: (V ст. до н.е. – початок XX ст.)

***Анотація.** У статті здійснено аналіз етапів становлення та розвитку архітектури театру (від давнини до 1900 року) у відповідності з еволюцією культури, історичним, соціальним і економічним розвитком людського суспільства. Представлено опис технологій театральної будівлі різних епох, її норм проектування і будівництва. Авторами виконана спроба пояснення еволюції архітектурних стилів театральних будівель від давніх часів до сучасності. Це допомагає розуміти вплив культурних, технологічних та соціальних чинників на архітектурні рішення. Розглянуто також вплив розвитку особливостей архітектурних стилів у будівництві театрів різних епох на культурну спадщину. Авторами наголошується про необхідність всебічного висвітлення важливості розгляду архітектурних особливостей театральних будівель, як частини культурної спадщини різних народів та епох. З цією метою авторами здійснено огляд архітектурних шедеврів, які стали символами своїх міст або країн. Окремо авторами розглянуто питання технічного прогресу при будівництві театрів у різні часи. Ця частина статті присвячена поясненню технологічних інновацій, які вплинули на архітектуру театру, такі як покращення акустики, освітлення та конструкційні методи. Також авторами статті виконано огляд сучасних тенденцій у використанні матеріалів та енергоефективних рішень. У статті виконано аналіз зв'язку між розвитком архітектури театру та соціальними аспектами, такими як зміни у смаках глядачів, роль театру у суспільстві, та відображення політичних та культурних тенденцій у будівлях. Авторами статті виконана спроба визначення впливу архітектури театру на сучасну архітектуру та суспільство. Зокрема, зроблено огляд впливу спадщини видатних архітекторів театральних будівель та їхній внесок у розвиток архітектури загалом. У статті показано, що розширення типологічної структури архітектури різних театрів створило передумови для розмаїття композиційних схем і принципово відмінної постановки архітектурних завдань. Різні градобудівельні умови, типологічні*

основи і індивідуальні особливості театру призвели до появи нових споруд, які контрастні за своєю структурою, стилістикою і засобами художнього вислову. Історичний досвід свідчить про те, що театральна архітектура така ж невичерпна, як і театральне мистецтво, як невичерпне і складне багатозначущє поняття театру.

Ключові слова: театральна архітектура; мистецтво; сцена; мистецтво архітектури; культура

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