

CONSERVATION AND PRESERVATION OF THE CULTURAL HERITAGE OF ANCIENT THEATRES AND *ODEA* IN THE EASTERN MEDITERRANEAN

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ABSTRACT

Many aspects of ancient theatres have attracted interest in recent years. The theatres of the Eastern Mediterranean are among the most precious and spectacular monuments of cultural heritage in the region, with an important role in cultural diversity and social and economic development. Theatre reuse not only serves conservation but also raises public awareness. There is a need to generate a strategy or process for preserving and using theatre heritage as records of Eastern Mediterranean history. This paper investigates how interpretation through reuse can enhance the role of theatres, especially those in an urban setting. New ideas for construction and installation of removable structures are presented, with the aim of establishing regulations on the use of each site with theatres and *odea*. Finally, it discusses how to enhance and preserve the historic information, the artistic and structural requirements and acoustic standards in ancient theatres, especially the appropriate or necessary level of sound clarity.

ÖZET

Son yıllarda antik tiyatrolar bir çok açıdan ilgi görmektedirler. Doğu Akdeniz'deki antik tiyatrolar, bu bölgedeki kültür mirasları arasında en görkemli olanlar olup, kültürel çeşitlilik, sosyal ve ekonomik gelişme bakımından önemli bir rol oynamaktadırlar. Antik tiyatroların yeniden kullanıma açılması, hem konservasyon alanı, hem de toplum bilincini uyandırması açısından çok faydalı olmuştur. Antik tiyatroları korumak ve Doğu Akdeniz tarihini belgelemek açısından kullanmak için bir strateji geliştirmeye ihtiyaç vardır. Bu çalışma, yeniden kullanım sonuçlarının yorumlanmasıyla ilgili yeni fikirler öne sürülürken, tiyatro ve *odea* bulunan antik şehirlerin kullanımına bağlı bazı düzenlemeler tartışılmaktadır. Ayrıca, tarihsel bilginin korunması, antik tiyatrolarda kullanılması gereken akustik standartlar, artistik ve yapısal gereklilikler ve uygun ses düzeninin oluşturulması gibi konulara da değinilmektedir.

INTRODUCTION

Although ancient theatres began to be the subject of scholarly studies in the late nineteenth century, they have not been paid the attention they deserve [1]. In ancient Greece the theatre was considered a kind of 'school' and theatrical presentations were major events. Every city had its own public entertainments and accordingly a theatre (and later an amphitheatre) were important parts of the original planning and later expansion of Roman cities [2, 3]. A smaller, more specialized type of theatre — identified by the generic Latin term *theatrum tectum* (roofed theatre) — was developed concurrently with the large, outdoor theatre. This smaller type, the *odeum* (plural *odea*, Greek *odeon*), was used for music, poetry and meetings [4, 5]. Often, the *odeum* was built near the larger open-air theatre, while the amphitheatre was located further away.

Historically, the acoustics of open-air theatres interested *Vitruvius*, [6, book V, chapter vi]. As auditoria provide both visual and acoustic stimuli, engineering, architectural and acoustical problems for a theatre were surely far more complex than for other public buildings, Fig. 1 [5, 7]. It is relatively simple to design buildings with good sightlines but acoustic properties are more complex and not so readily assessed.

A principal reason for the acoustic success of ancient theatres was that disturbing environmental noise was generally subdued when they were in use. Meanwhile each theatre posed its own problems, usually arising from its topography and landscape [5, 7, 8]. In general, there is a connection between the function, location and size of the different theatres. Location was affected by general city planning and directly related to the principal elements forming the urban fabric: the *cardo* and *decumanus*, forum

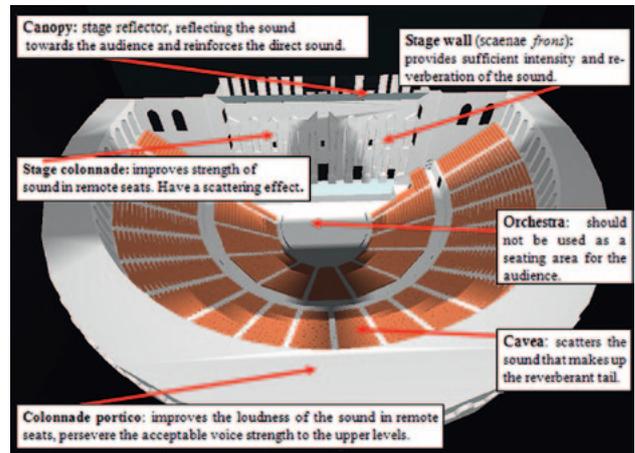


Fig. 1 The main architectural and acoustical elements of a typical open-air Roman theatre. Image: Naif Haddad.

and temples. Theatres tended to be sited around temples, the relationship between theatre and temple emphasizing the spatial and temporal concepts of the dramatic play in the Classical and Hellenistic periods [7, 8].

The surviving ancient theatres and *odea* are places with Greek and Roman cultural significance. Their economic value can be clearly understood through the benefits of saving the built heritage by re-use for tourism, modern needs and pleasure, within the cultural context. As such, these cultural heritage sites have a vital value for all citizens as an important basis for cultural diversity and social and economic development and they should continue to be a source of information for future generations as the physical documents of a significant phase of history.

LOCATION, STRUCTURE, LANDSCAPE AND ORIENTATION

Most Eastern Mediterranean theatres are Roman and were used not only for drama but also as multi-functional social, religious and political meeting spaces [7, 9, 10]. Some are still in use today as places of performance, making them the only monuments from Classical antiquity still serving their original purpose. At present, most are subject to natural threats (wind, temperature, rain) and to human threats through inappropriate modern uses. These include overcrowding, air and noise pollution and the thermal effects of lighting systems [11]. In most theatres, the stages and upper parts have been damaged, Fig. 2. The absence of conservation plans, lack of maintenance, poor application of conservation principles and lack of appropriately skilled personnel can cause further decay to the structure or attributes of these historic monuments.

The contribution of theatre design to the urban landscape

In ancient city planning, the location and orientation of theatres — and in particular the relationship between these two factors — were significant. Theatre construction, architectural planning and technical execution all demonstrate a high degree of excellence but each theatre posed its own problems, which typically arose from its topology [5, 7]. Eastern Mediterranean Roman theatres were constructed according to the landscape of the site. Sites can be classified into three types, based on the



Fig. 2 A performance held in the Jerash south theatre during the 1999 International Jerash Festival of Culture and Arts. The arrows show some unsafe places for the crowds and audience to sit. Photo: Naif Haddad.



Fig. 3 Philadelphia (Amman) great theatre is used today for performances. The stage wall has been partially restored, but not to its original height. Loudspeakers are placed on the stage but should be located in the orchestra to avoid problems with echoes. Photo: Naif Haddad.

location and orientation of the theatre: a sloping hill site, a totally flat site or a semi-sloping hill site [7, 8].

Arthur Segal divided the surviving Roman theatres in Greater Syria (Jordan, Syria and Palestine) into two primary categories [5]:

- Urban theatres: those erected within cities and intended to serve the city's own population, such as Gadara (Umm Qais) north and west theatres, Jerash (Gerasa) north theatre, the great theatre and *odeum* in Philadelphia (Amman: Fig. 3) and the *odeum* at Bosra.
- Ritual theatres: those built in sanctuaries outside the cities and serving the diversified population that frequented the sanctuaries. The main characteristic of these theatres is that many never had a stage building at all, such as the Nabataean ritual theatres at Wadi Sabra and the theatre at Hamat Gader.

Of the 41 theatres of Greater Syria, 14 are in Jordan: three each at Jerash and Petra, two each at Amman, Gadara and Qweilbeh (Abila) and one each at Pella and Capitolias (Beit Ras). If we examine these theatres as a single group, we see that they were built both according to Roman tradition and relative to the landscape formation of the site. Of the three topographic types listed above, the first is represented by the great theatre in Philadelphia, the north theatre of Umm Qais and the festival

theatres of Jerash and Abila, the second by Amman *odeum* and the third by the west theatre of Umm Qais, Pella theatre and the north and south theatres of Jerash [7, 8].

If we consider their relationship with temples, we can see that the theatres at Jerash were located close to temples (following the Hellenistic tradition of placing them to the west), while at Amman a small shrine was located at the top of the theatre (an example of the Roman tradition). Umm Qais west theatre was dedicated to the goddess Tyche.

Orientation

Any theatre used for summer performances — especially in the Eastern Mediterranean — would have to be configured to provide suitable shade and lighting for a large part of the year when the most important performances were presented. A north east orientation would be ideal, providing shade for the audience and illuminating the actors [7, 12].

The majority of Eastern Mediterranean theatres are oriented towards the north to protect spectators during summer while allowing use from spring to autumn; 35 of the 41 Roman theatres (including three *odea*) in Greater Syria have a northern orientation [7]. The theatres whose orientation is not towards the north are mainly small, roofed *odea*.

INTERPRETATION THROUGH REUSE

Modern use is altogether different from ancient use and is of three main types: conferences and receptions, tourism and festivals [9, 11]. Since the cultural significance of many theatres is not readily apparent, their conservation, preservation and restoration are necessary. As ancient and vulnerable places, theatres should be granted a new lease of life through modern use. In fact, reuse is sometimes now suggested as a means of conservation as well as justification for the enormous costs that restoration and conservation entail. Nonetheless, most decision makers and conservation professionals are more conservative and reluctant to encourage reuse.

Experts who took part in the activities of the European Network of Ancient Places of Performance and the Minotoc Project have drawn up guidelines for implementing the Verona Charter on the Use of Ancient Places of Performance [11, 13]. The main issues can be summarized as: facilitating comprehension by the public, enhancing the sites by using them, managing places of ancient performance by contributing to their development and improving skills through networking.

Theatre interpretation can play a significant role in presenting the aesthetic, historic and scientific values of these rich heritage centres to the local community and the surrounding regions. Theatre reuse not only facilitates proper conservation but can also raise public awareness. Performances and events can play a major role in the sustainability of theatre heritage, benefiting the local community and enhancing audience knowledge of this type of monument [7]. They can also bring funds to develop and preserve the cultural significance of these sites while creating new jobs for local people. The conservation of ancient theatres can encourage tourism programmes in which local communities can work as partners in decision making to preserve, protect and promote these monuments. Income can also be generated for national and local government, encouraging local authorities to seek funding for conservation and maintenance and to conduct studies on the impact of visitor numbers and vibration on ancient theatres.

Interpretation and management of these places should ensure the participation of local people for whom they have special associations and meaning or who have social, spiritual or other cultural responsibilities for the place [14]. The Epidaurus Festival is a good example of local community participation. For dec-

ades, the first audience and critics were local villagers. Then, in 1938, the successful presentation there by the Greek National Theatre of Sophocles' *Electra* provided the green light to the Archaeological Council to proceed with theatre restoration, thus bringing the site to life [11].

Tourism activities should be compatible with conservation and interpretation programmes and should include a comprehensive plan for activities and performances that present an accurate history of theatre heritage. Through interpretation, the needs of visitors, audiences and local communities can merged with those of the site. The latter should include treatment of the fabric (maintenance, restoration and reconstruction) combined with the provision of on-site activities and explanatory material [14]. Such information, a popular interpretation of the current state of knowledge, should be revised frequently to ensure it is up-to-date [11]. Interpretation can play a significant role in conveying cultural values to both local communities and regions, leading to improved understanding of such heritage sites. It can also assist in changing societies through:

1. Respecting the diversity of cultural value for the local community. This can be achieved by explaining the development of the theatre site and the services and infrastructure projects that put the region on the tourist map. In addition, interpretation should be based on a clear explanation and definition of the cultural significance of the theatres and *odea* (e.g. their aesthetics, history, function and physical characteristics). Multimedia tools, workshops, guidebooks and websites are important tools for comprehensive interpretation for all visitors and audiences.
2. Respecting the diversity of visitors and audiences. This can be aided by multilingual presentations, publications, tours and websites. This offers a wider distribution of benefits while relieving pressure on more popular places by encouraging visitors to experience the wider cultural and natural heritage of a region or locality, as recommended by the International Cultural Tourism Charter [15].

ARTISTIC AND STRUCTURAL REQUIREMENTS AND ACOUSTIC STANDARDS

For historic sites, understanding cultural significance should come first, then development of policy and finally management [14]. Given that they are manmade spaces designed for dialogue between audience and actors, the cultural significance of ancient theatres and *odea* should be defined in relation to four main issues: their existence as ancient landmarks, their existence as impressive architecture, their use in modern cultural performances and their acoustic qualities [11]. Conservation principles rarely consider the technology of acoustical simulation. Technical studies should identify the original technologies found in theatre and *odeum* designs, such as acoustic systems, lighting and distribution of seats. Computers are useful for developing acoustic models and designing new ways of using theatre space while also providing new information for conservation, especially concerning the acoustical importance of architectural elements of the ancient theatres and *odea*.

With room acoustics simulation software it is now possible to model ancient theatres in a virtual environment, requiring a multi-disciplinary approach. The use of virtual reality, three-dimensional modelling and animation is now fundamental to the conservation and interpretation of such theatres and their use in ancient times [16, 17]. This approach provides them with a virtual life in this digital age. It also facilitates the generation of historical and archaeological experiences using techniques



Fig. 4 Aspendos theatre was used until recently for performances, with performers located in the orchestra. The existence of the colonnade portico improves loudness of the sound in remote seats. Photo: Naif Haddad.

of computer animation, while reducing the need to reconstruct historic sites.

Conservation of the acoustic characteristics of ancient theatres and odea

An important issue in conservation and restoration of ancient theatres and *odea* is how to create a sense of space in which acoustical reflections and visual imagery are important components. If we use ancient theatres for modern performances with modern technology, we have to ensure that no harm is done to the original acoustics of the building. It is necessary that a system for describing and rating ancient theatre acoustics is in place before any intervention is carried out on these monuments. This is done by acoustic simulation, auralization, measurement and analysis of the ancient theatres and *odea* using computer software [18–24]. The European Commission's ERATO (identification, evaluation and revival of the acoustical heritage of ancient theatres and *odea*) project makes it possible for the first time to hear these significant structures as they sounded in the past and to feel their sense of space. In this way, many previously unanswered questions relating to the acoustics of such spaces can be answered. Examples of what ancient Roman theatres sounded like can be heard on the ERATO website [25]. The ERATO project has provided new information concerning the acoustical importance of the various architectural elements in ancient theatres. It has become possible to predict the acoustical properties of a theatre under varying conditions, leading to valuable information regarding the acoustical consequences and likely degree of authenticity of both permanent restorations and temporary amendments [19, 23].

Recent acoustical research demonstrates the significance of architectural elements including the colonnade, stage wall and canopy, Fig. 4 [18, 19, 21]. Simulations show that the stage wall (*scaenae frons*) is important for providing sufficient intensity and reverberation of the sound but many modern performances in ancient theatres still place the loudspeakers on the stage directed away from the wall. Many restored theatres have this deficiency (for example the Philadelphia Great Theatre, where the stage wall was restored to only one storey, Fig. 3). Restoration (including anastylosis) of the stage wall can improve the source loudness and speech intelligibility by reflecting the sound towards the audience and reinforcing the direct sound. The stage colonnade has a scattering effect, improving sound distribution, and the colonnade around the *cavea* improves strength of sound in remote seats, Fig. 1. However, the overall acoustical preference is for the sound source to be on the proscenium near the stage



Fig. 5 The Roman theatre in Verona is still used for modern performances, with an audience seating area in the orchestra. The stage is installed with removable structures. Photo: Naif Haddad.

wall rather than in the orchestra [20, 22]. Restoration of the stage and the portico to their original levels and layout provides the optimal acoustical performance, Fig. 4 [19, 21].

New ideas for the construction and installation of removable structures

The use of computers to develop an acoustic model can assist in designing new ways to use theatre spaces. In order to improve sound reflections from the orchestra floor, the orchestra should not be used as a seating area for the audience and loudspeakers should be located in the orchestra to avoid problems with echoes, Figs 1 and 4. These results were demonstrated by acoustical measurements using three-dimensional models in the ERATO project [18, 19, 21, 23]. Thus, the portico is not only architectural: it has an acoustic function (as mentioned by Vitruvius), providing acceptable voice strength to the upper levels, Figs 3 and 4 [12].

Any theatre conservation plan today should provide appropriate facilities for the public and deal with acoustical qualities. Certain architectural elements have particular impact on the quality of the audience's listening experience: the height of the stage wall and its decoration with columns and statues is particularly important, while the colonnaded portico behind the audience in the Roman theatre is acoustically necessary [21]. In the case of *odea* (where the roof is acoustically most important) this does not necessarily mean that they should be fully restored with a new roof. Movable, lightweight structures and stage scenery can be installed in order to improve acoustic quality, Fig. 6. This will encourage many new activities, including cultural and artistic creations. At the same time, other basic facilities (seats, rubbish bins, toilets, disabled access and water) and public safety measures (hazard prevention, medical and emergency facilities and the building of attractive paths that steer the public away from fragile areas) can be provided [9, 11].

Acoustic qualities that need to be considered in the conservation process include the *clarity* of the sound, which should be high and evenly distributed, and the *strength* of the sound, which is relatively weak and decreases with distance, especially for theatres and *odea* in an urban setting that suffer from competing modern noise. In rare cases, reconstruction can also be appropriate as part of a use or practice that retains the acoustical significance of these places [14].



Fig. 6 Virtual reconstruction of the inside of a Roman theatre. Reconstruction of some architectural elements, including movable, decorative structures, can improve listening enjoyment for the audience. In Roman theatres, the height of the stage wall and decoration with columns and statues were particularly important. Image: Erato project.

A combination of old and new technologies can assist in producing new information and ideas for the construction and installation of temporary structures in ancient theatres and *odea*, with the aim of establishing regulations for the use of each site that respect both authenticity and reversibility. In the case of reuse, all activities of visitors, audiences and the local community on the site should be checked, monitored and documented and retained as part of the history of the theatres and *odea*.

CONCLUSION

The long-term protection and conservation of cultural heritage places with theatres and *odea* — including their physical integrity and environmental context — can play a vital role in social, economic, cultural and tourism development policies in the Eastern Mediterranean. Investigations of scale models show that the architectural layout in the Greek and Roman periods has an influence on acoustic parameters. By means of conservation, restoration and anastylosis of the architectural heritage and through interpretation we can aid in preservation of their historic and material aspects. The cultural significance of many Eastern Mediterranean theatres and *odea* is not readily apparent but their interpretation through reuse can enhance understanding and enjoyment as well as being culturally appropriate. Reuse is needed not only for conservation purposes, but also — and most importantly — to raise public awareness.

To achieve sustainable development that balances the needs of the audience, visitors and the local community with the needs of theatres and *odea* within the whole site, a multi-disciplinary approach is needed. Modern use of theatres should respect their original function and encourage research into the effects of events on ancient theatres. Moreover, enhancing a theatre's physical heritage could arouse audience interest in the ancient theatre, allowing it to become a source of information for future generations and a document of Mediterranean history.

In order to promote human comfort and take advantage of the acoustical design of ancient theatres and *odea*, the conservation and restoration of acoustical characteristics should be considered as a priority. Restoration and anastylosis of the stage and the colonnaded portico to improve the sound volume would make sites with theatres and *odea* in the Eastern Mediterranean more attractive to audiences, Fig. 4. This is a new approach to the conservation and restoration of theatres and *odea* and there is a need for comprehensive studies on ancient building design and technologies in order to generate a strategy or decision-making

process for preserving and using theatre heritage in the Eastern Mediterranean. Even if the acoustical and architectural significance of these heritage monuments is restored and revived, to be enjoyed by modern audiences, a balance needs to be struck between conservation and reuse.

Further research is needed to clarify mechanisms that can protect the monuments while meeting the expectations of audiences, visitors and local communities. This research should also define a system of regular monitoring to ensure that conservation issues (restoration, maintenance, interpretation and presentation), promotion and marketing, monitoring and reassessment and guidelines for the acoustic adaptation of ancient theatres and odea for modern performance have all been taken into account.

For the conservation and management of ancient theatres, it is proposed that:

1. The conservation principles adopted should be appropriate to the original building technology, partly to preserve the integrity of the original design but also for practical reasons. A flexible approach and a clear evaluation of the acoustical significance of the existing theatre fabric are required.
2. The new target for those involved in digital acoustic technology should be to infuse ancient theatres and odea with their full role as places of cultural and artistic creation, shared enjoyment and emotion.
3. Regular monitoring of the physical fabric after conservation work and public events is essential, given the site's vulnerability. Such monitoring should be undertaken before, during and after performances.

A dialogue is needed between those specialized in acoustics and those involved in the process of theatre conservation; they should concentrate not only on the artistic and structural requirements of the building but also on achieving high acoustic standards by means of modern technology. It is now possible to determine if such investments are effective and can really increase and diffuse knowledge of theatre heritage while also satisfying the requirements of users.

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