of this engagement serves to emphasise the dynamic nature of this contact. Manifesting itself as not only an excursus of the art of the Hellenistic east, a task taken up by numerous other volumes, this book achieves in drawing together apparently disparate sources of evidence, from sailing techniques to philosophy, to encapsulate the complexity and scope of this area and its civilizations during the Hellenistic period and beyond.

As a collection of a wide variety of well-written and researched chapters, this volume would make a valuable addition to any university syllabus that deals not only with the Hellenistic regions, but the effects of cultural interaction in the ancient world. The dual language nature of this book though would perhaps limit this to postgraduate or a few students capable of comfortably and critically engaging with both English and French articles. Nevertheless, this volume offers a concise yet highly informative and thought provoking introduction to the cultural legacy of the Hellenistic and Hellenized East, which in turn is a valuable contribution to the ongoing reanalysis of the idea of 'Hellenization'; a term that is becoming increasingly difficult to accurately attribute.

Mairs, R. 2014. *The Hellenistic Far East: archaeology, language and identity in Greek Central Asia.* Berkeley: University of California Press.

Prag, J. and J. Quinn (eds) 2013. *The Hellenistic West: rethinking the ancient Mediterranean*. Cambridge: Cambridge University Press.

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Roman to Late Antiquity

Manolis Korres. *The Odeion Roof of Herodes Atticus and other Giant Spans*. pp. 192, 103 b/w & 26 colour figures. 2015. Athens: Melissa Publishing House. ISBN 9-7-8960204-340-0 hardback €64.66.

The Odeion of Herodes Atticus, built between AD 160 and 169, is a looming hulk of a structure. It could have housed, at a reasonable estimate, around 6000 spectators. Despite its size and relatively good state of preservation, the building remains something of an enigma. In particular, the thorny issue of whether it was roofed, open-air, or partially covered in some way has rumbled on for well over one hundred years. Any roof would have had to cover a space measuring c. 83m east-west and c. 56m north-south, which would make it the largest roof span known from antiquity. Undeterred by the staggering scale of the undertaking, Manolis Korres here presents his case for a roof. In this beautifully put together, stunningly illustrated volume, Korres combines careful study of the structural remains with detailed discussion of the practicalities of creating a roof of this scale. It would take a structural engineer to provide a full appraisal of many of the more technical aspects of Korres' reconstruction and so, in what follows, I will focus primarily on his archaeological and architectural observations.

Whether the *koilon* (or *cavea*) of the Odeion was roofed or not has been debated since at least W. P. Tuckermann's 1868 publication of the building.[1] Some scholars have denied the existence of a roof altogether, while others have argued that it was only partially roofed. Tuckermann falls into the later category, as does G. Izenour, who includes the building in his monograph on roofed theatres, even though he argues against it being completely covered.[2] The case for a partial roof has also been pushed more recently by M. Galli and D. Dinelli.[3] Korres, famous for his direction of the Parthenon restoration works between 1983 and 1999, first turned to the question of the Odeion and its roof when he was commissioned to design a model of the structure, and the wider Acropolis area generally, for the *Ancient Athens* exhibition of 1985; his beautiful models have been seen by tens of thousands and are now in the new Acropolis Museum. In 1985, Korres came up with a solution for a roof that he was prepared to incorporate into

[1] Tuckermann 1868.
[2] Izenour 1992.
[3] Galli and Dinelli 1998.

his model, influenced in part by the earlier works of S. Ivanoff and R. Meinel, who had both also argued for a full covering.[4] Thirty years later, this volume to some extent represents Korres' defence of his earlier model.

The question of whether the Odeion was fully roofed or not rests on two principal issues: first, if it was roofed, why is there a drain around the edge of the *orchestra*; second, would it even have been possible to roof such a large space. Those in favour of the partial roofing solution have proposed an opening in the roof above the *orchestra*. Those in favour of a full roofing scheme have argued that the drain was for ground water and pointed to other evidence for roofing, including the extensive evidence for burning in the complex and the presence of roof tiles. They have also pointed to the texts of both Philostratos ('a roof of cedar wood', *V S* II.1.5) and the Suda ('a roofed theatre'), which would seem to support their case.

Korres begins his defence of the full roof model below and at ground level (Section B2). The cutting back of the Acropolis hill to provide a terrace for siting the Odeion, he argues, would have led to issues with groundwater. Water flowing from the hillside would have to have been channelled away, as in the case of the nearby Stoa of Eumenes, where buttresses and a drain were installed along the structure's rear. The drain running around the orchestra could have been deliberately designed to collect such ground water flowing out from the bottom of the *koilon*; however, even without an enormous ground water problem, the operators of the Odeion would still have needed gutters to remove overflow from cleaning (mopping of the marble floor and seats) or rainwater entering through the building's large windows. This drain, therefore, is not the silver bullet that those critics of the full roof scheme have supposed. In making this point, Korres also provides a detailed discussion of the site of the Odeion prior to its construction, when it was a residential area, and the impact that its placement had on the pre-existing road system, and especially the Peripatos, the road running around the Acropolis. All of this is beautifully illustrated.

The core section of this study (Section B3) concerns how to reconstruct the building and especially its roof. Here Korres focuses on the surviving remains of the structure, especially the front wall of the complex and the *skene*, the *koilon* itself, and the curved rear wall. Close analysis of each is used to support his case that the building had to be roofed. First, the front wall and *skene*. The former was certainly punctuated by a large number of windows, twenty-three of which are still visible, while Korres argues for a further eleven. On the interior of this wall, the façade of the *skene* was decorated with a single order of columnar decoration, not multiple orders as is typical of contemporary theatres; above this single order the vertical wall of the *skene* was decorated with rows of niches and the aforementioned windows. In the *koilon*, on the other hand, Korres argues against the existence of an upper *diazoma* or stoa at the top of the *koilon* – a *porticus in summa cavea* – on the basis of cuttings and Roman concrete found in this area that indicate seating extending as far as the curved rear wall. This is important, since previous scholars have argued that the roof mentioned in the sources comprised a small covering for the stage building and perhaps a covered colonnade of this sort, instead of a full roof.

The bulk of Korres's efforts in this central section, however, are devoted to the monumental semi-circular rear wall of the Odeion. This wall is an extraordinary 2.65m thick for most of its length, much thicker than similar walls of open-air theatres or amphitheatres, which tend to range from 1.40-1.60m. The structure itself is comprised of a double ring of ashlar walls, connected by ashlar ribs. Between these ribs a series of voids covered by barrel vaults were installed to lighten the load. In places, however, the gaps between the internal ribs in this wall were narrowed and filled with concrete; in these chambers the wall facing the *koilon* was also constructed of brick rather than ashlar. These internal vertical reinforcements have not properly been noted or analysed before and they have a broader significance in Korres' case for the roof. There are only six exterior buttresses visible currently on the Odeion, three at either end of the curved rear wall. More have been proposed, but Korres notes that they could never have originally existed (there is not space for them) and, in any case, they were unnecessary: the slope of the hillside did the same job as external buttresses at the rear of the *koilon*. The internal reinforcements were not intended, therefore, simply to replace external buttresses but rather to support some sort of massive load. Furthermore, these internal reinforcements align with similar reinforcements and buttresses on the *skene* wall of the Odeion. This fact, Korres concludes, 'not only proves that the walls were designed to assume great loads at certain points, which only a roof with its main beams could impose, but, also, reveal the arrangement and positions of the trusses of such a roof' (p. 70). The spacing of the internal reinforcements and of the vaulted voids in the wall are also used by Korres to reconstruct the original spacing of windows through

[4] Ivanoff 1858; Meinel 1980.

the semi-circular wall. The presence of windows in this wall is also suggested by its considerable height, rising as it does 11m above the highest row of seats – two to three times the height of rear walls in typical open-air theatres.

Having established that certain technical features were incorporated into the design of the Odeion with the intent of providing support for a roof and lighting for a large enclosed arena, Korres moves on to the question of whether such a roof ever existed. His first body of evidence is thermal damage. Excavations in the 19th century uncovered widespread evidence of the destruction of the complex by a massive fire. Large burnt timbers were found, as were roof tiles. Thermal damage is most obvious on the seat blocks of the *koilon* and in places indicate a very substantial and prolonged fire. There was evidently some form of massive wooden structure that caught fire and burned for a long time in this space, and a roof would certainly fit the bill. While this much seems to be clear, the bigger problem is how such a space could have been roofed? Providing a solution is really what this study is all about. The roof was tiled, to judge from the finds made during excavation. It must also have combined an orthogonal ridge section over the *paradoi* and *proskenion* and a half-conical section over the *koilon*, an awkward overall scheme. The total surface area of the roof Korres calculates as 3600m^2, meaning that the weight of its tiles alone must have been around 180 tons. The trusses supporting the roof are reconstructed by Korres as arranged side by side, parallel to each other and perpendicular to the front wall of the Odeion. They could not have been laid perpendicular to the curved wall in a radial arrangement since there is nowhere that they could have been supported at the point where they joined; a central pillar in the *orchestra* would have been needed. Trusses laid in parallel is the simplest solution but the central trusses would each have to have been 50m in length, while the shortest of the main trusses would still have to have spanned 21m. To give some context, the Basilica Ulpia in Rome has a roof span of around 27m. The tie beams of trusses of this length would obviously have to have been constructed from multiple lengths of timber and the same is true of the rafters above these tie beams. In a simple roof, these trusses would typically have been triangular but when the span is as large as in the Odeion, Korres argues instead for arched trusses, with the individual lengths of the rafters arranged to form a sort of polygonal arc. This would have reduced the stress on the timbers. These arched trusses would never have been visible: above them, they supported a superstructure on which the roof tiles were laid, while from below the audience would only have seen the ceiling, suspended between the tie beams. Judging the validity of Korres' calculations is beyond my expertise. From an archaeological perspective, however, this solution makes sense; it accords well with what is still visible on the structure (notably its thick walls and internal supports). The engineering of the roof, as Korres notes, is not overly complicated on paper. Executing it, however, would have been a different matter.

The discussion of the actual construction of this enormous roof focuses on four issues (Section B4): the arrangement of the worksite; the timbers employed; the scaffolding used; and the workflow on site. For the preparation of the massive trusses, which had to be worked and assembled on the ground before being dismantled and hoisted into place, Korres proposes the terrace of the Stoa of the Eumenes, on which a temporary shed could easily have been built. For the timber, Korres provides a detailed table of the necessary requirements, concluding that at least 3000 trees of the desired size had to have been felled. The detailed workflow that Korres provides in this section highlights the multifarious complexity of the project: the ordering of materials, preparation of the ground, construction of the cranes and other lifting and transport devices – all of these factors had to be carefully planned and staggered to ensure smooth progress. Korres provides three beautiful reconstruction drawings showing different stages of this process. Adding a roof to this structure, of course, drastically complicated the construction process, particularly as relates to the interior fittings. Finished marble blocks either had to be installed before the roof or transported into the interior via a side entrance, since they could not be lowered in by crane; the same applies to other marble furnishing that one might not want to be installed before the roof and its associated forest of scaffolding had been completed and tidied up. Korres argues, quite reasonably, that much of the work carried out on the Odeion's roof was pushing the boundary of what had been done previously. A certain amount of experimentation must have been carried out beforehand, and in the final section of this core analytical chapter, he imagines the kind of experiment that the architect would have to have carried out to test the effectiveness of the trusses.

The final section of the analysis of the Odeion, presented as a series of appendices, focuses on the adjacent Stoa of Eumenes, Kyriakos Pittakis' excavations of the Odeion, the monument of Fabvier which was built into the front wall of the Odeion in 1855, and ancient Greek music (authored by S. Koutrouli). The third part of this volume concerns other 'giant spans' in historical

architecture. One of these, in particular, proves key to Korres' reconstruction of the Odeion roof, and that is Apollodorus' great bridge over the Danube. This section represents a phenomenal case study of large-scale construction in wood in the Roman world and is worthy of attention in its own right.

To describe Korres' study as unconventional is to understate the case. It is both innovative and idiosyncratic. This is especially clear in the first thirty-two pages, in which Korres present something of an oddity: an imagined dramatic narrative, involving nineteen characters, focused on the commissioning and construction of the so-called Odeion of Herodes Atticus. This narrative begins with Herodes laying out his plans for his music hall, 'bigger and finer than any other', and follows the architect through the design process as he grapples with the challenge of creating such a vast interior space and, in particular, roofing it: *Herodes* – 'my cunning friend, look me in the eye and tell me: not what you might think or guess, nor what you suppose would offer me greater satisfaction, but only what is scientifically certain! Is it possible to span a distance of 166 feet?', *Architect* – 'Yes, even if it surpasses what has been anticipated until now, in this type of building, ...yes!' (p. 19). This is all fairly hammed up and light-hearted, verging in places on the surreal. However, it has a certain impact and a clear purpose. It acts, in a way, as a sort of thought experiment, through which Korres, an architect and engineer, can put himself back in the shoes of the ancient (and anonymous) architect challenged with creating this enormous building. What this narrative does is provide a testing ground for considering the practicalities of the processes and solutions that underpinned this project. As well as explaining certain technical details of the structure, this narrative serves to explore the possible relationship, occasionally strained, between architect and commissioner, the presentation and continual adaptation of the various iterations of the design, the sourcing of materials ('...the initial 320 stones in three months...'; (p. 22) '...wonderful timber oak in the district of Emona' (p. 22)), management of the workforce, and arrangements of cranes and scaffolding. This narrative stops mid-project, at which the reader jumps from an imagined 2nd-century AD Athens, to Korres' detailed discussion of the technical aspects of the site and surviving remains of the Odeion, as described above.

Korres' aim here is to appeal to 'the non-specialist who wishes to learn about, even with some difficulty, the amazing world of great technical works.' (p. 6). There is much that is difficult here but there is also a vast amount of extremely stimulating discussion of ancient engineering and the potential of large-scale construction in timber. The numerous illustrations are extraordinary. They are often confusing: many show reconstructions that the author then dismisses as improbable in the text; and there is no basic plan or elevation showing the key dimensions of the complex. However, the reconstruction drawings of the roof trusses, notably the colour plates by V. Chasapis, are immaculate. The text presents certain challenges too. Translated from Greek by five different people, they differ quite considerably in style and phrasing, which can be a little off-putting. These, however, are minor issues and should not detract from what is a stunningly presented discussion of a complicated and much-overlooked building. Anyone interested in ancient architecture or engineering will find this volume fascinating.

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Alexandra Eppinger. *Hercules in der Spätantike. Die Rolle des Heros im Spannungsfeld von Heidentum und Christentum* (Philippika: Altertumswissenschaftliche Abhandlungen / Contributions to the Study of Ancient World Cultures 89). pp. XI+408, 14 b/w illustrations. 2015. Wiesbaden: Harrassowitz. ISBN 978-3-447-10418-0 hardback €98.00/£82.44.

In this revised thesis by Alexandra Eppinger (hereafter 'E.'), defended at the University of Heidelberg in 2013, the ubiquity of Heracles/Hercules in the art, archaeology, and literature of 'the long late antiquity' (defined as c. 250-600 AD) is ascribed to a desire by individuals or communities – be they pagan or not – to come across as 'learned', to