

## Editorial

# Brick Vaults in Southern Portugal

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‘Los nombres de las bóvedas son tantos, quantos son sus diferencias.’

[The names of vaults are as numerous as their differences]

Lorenzo de San Nicolás (1639) 1796, 124

There are many types of vaults, and vaulted architecture spans a vast universe of time, space, and typology. As a subject intersects multiple disciplines and fields of knowledge. Vaults can be understood from various perspectives – whether focusing on their structural role, their geometric form and resulting spatial configuration, on construction systems and materials, or on finishes and ornamental elements, both painted and sculpted in relief, thereby engaging other forms of artistic expression. Moreover, all these perspectives can be examined across different historical periods and in relation to their geographical distribution.

This issue of the *Revista de História da Arte* focuses on brick vaults within a broader concept of vernacular architecture. Consequently, stone vaults – whether built with ashlar masonry or rubble masonry, rendered and painted – are excluded, as these are generally associated with the major building sites that have shaped Architectural History. Therefore, the term vernacular is used here in an inclusive sense, not in its more recent and widespread association with the popular, but in a broader and etymologically rooted sense, referring to constructions deeply embedded in the building traditions of a particular place or region.

The region we have chosen corresponds approximately to the eastern half of southern Portugal, covering parts of the Alentejo and the Algarve. This area was selected due to the significant concentration of architectural examples featuring vaulted ceilings and a common set of construction principles – ranging from urban buildings to scattered rural settlements, from manor houses to modest dwellings, and from convents or parish churches to small, isolated chapels. This regional focus also aimed to explore Iberian affinities along the southern border areas of the peninsula, specifically the potential continuities between the Alentejo and the Algarve, on one side, and Extremadura and Andalusia, on the other. Within this scope, we have excluded structures strictly related to fortifications, as they follow different functional and constructional principles. Similarly, the chronological framework of the studies remains fluid – largely due to the nature of so-called ‘anonymous’ buildings, which have left little documentary trace, but also because of the relative continuity in the use of brick vaulting in Christian religious architecture. Despite successive typological transformations, this tradition endured from the late Middle Ages through to at least the 19<sup>th</sup> century.

The study of vaults, that is, load-bearing structures with a curved profile that rest on the walls of a room or built structure, giving rise to concave ceilings capable of supporting an additional floor or a walkable terrace, has been underdeveloped in Portugal. Research on these structures has primarily focused on the more complex ribbed vaults of the late Gothic period, built in stone masonry (e.g. Genin 2009a, 2009b and 2014), or on timber vaults (e.g. Fidalgo 1998; Rei and Gago, 2016 and 2018), a lighter and more cost-effective alternative, which spread across the Portuguese territory from the 19<sup>th</sup> century onwards but which can hardly support additional floors or bear the weight of accessible terraces on their extrados. The vaults used in a current context, constructed throughout the period from the mid-16<sup>th</sup> century to the mid-19<sup>th</sup> century, have attracted little attention from Portuguese researchers, who have also not been particularly interested in exploring the guiding thread that favoured the use of brick from the time this material began to replace stone in Gothic ribbed vaults until the spread of timber vaulting. This gradual change, particularly pronounced in regions where clay-rich soils were abundant, was further propelled by advancements in transportation during the 19<sup>th</sup> century. These improvements facilitated the trade of gypsum, a more efficient mortar than lime for securing bricks face to face. By choosing to work on brick vaults without no other constraints than the material and the geographical areas where they are most abundant, we seek to fill a significant chronological gap in the knowledge of these structures, while also reconstructing the underlying historical narrative of their evolution.

The studies presented in this issue build upon the findings shared at the scientific meeting *Forum Vaulted South – Vernacular Building Knowledge and Brick Vaults*, held at NOVA FCSH and the Ordem dos Arquitectos from 16 to 18 November 2023. This event discussed the outcomes of the exploratory project *Vaulted South – Vernacular Vaulted Houses in the South of Portugal*, funded by the Fundação para a Ciência e a Tecnologia (FCT EXPL/ART-DAQ/0171/2021; <https://vaultedsouth.fcsh.unl.pt/>). The editors of this issue are members of that research team, as are many of the contributing authors, in their roles as researchers or research assistants. Other authors provided external contributions that enriched the discussion. Both within the internal team and among external contributors, interdisciplinarity and institutional diversity were essential to the study of this subject. Based at NOVA FCSH through CHAM – Centro de Humanidades, which hosted the project, the research also involved the IHA – Instituto de História da Arte as an associated institution. The project team also included researchers affiliated with various research units at Instituto Superior Técnico, University of Lisbon, and, in its final stages, the discussion benefited from the participation of researchers from the Faculdade de Arquitectura at that same university and from ISCTE – Instituto Universitário de Lisboa.

We introduce the theme through fundamental research into the identification and analysis of the textual corpus – written knowledge – on vaulted systems in general, as presented in the article ‘Architectural books and treatises: on the theory of vaults,’ co-authored by the two editors, Margarida Tavares da Conceição, Mafalda Batista Pacheco, along with researcher Raquel Seixas. This study traces the evolution of theoretical discourse, from the emergence of the topic in architectural treatises to the dissemination of practical manuals in the 17<sup>th</sup> century. It highlights the delicate balance between architectural theory and the practical application of construction techniques, with the 18<sup>th</sup> century marking a peak in the codification of vault geometry. This period also saw the widespread diffusion of essential construction knowledge, much of which was nearly lost with the rise of reinforced concrete systems in the early 20<sup>th</sup> century.

Following this, Ana Costa Rosado’s contribution, ‘The incorporation of vaults in the traditional housing of the inner Alentejo,’ offers a rare link between the survey of existing built examples and historical research, providing deeper insight into the possible origins and diffusion of this roofing type. The study distinguishes between two subtypes – brick vaults and timbrel vaults – tracing their emergence from the 17<sup>th</sup> century, their proliferation in the 18<sup>th</sup> and 19<sup>th</sup> centuries, and their continued presence even into the early decades of the 20<sup>th</sup> century. Furthermore, it introduces an important discussion on the potential influence of engineers involved in fortification works along the Alentejo border during the Restoration

period, as well as the role of written treatises. This influence may have played a significant role in the introduction of vaulted ceilings in common buildings, offering one possible explanation for their widespread adoption.

The next article, 'Types of Vaults in Southern Portuguese Architecture', authored by two of the editors, João Vieira Caldas and Mafalda Batista Pacheco, alongside Sérgio Costa, expands upon the extensive survey of identified and documented cases, based on substantial field research. This study deliberately encompasses a diverse range of examples – manor houses, common dwellings, convents, and chapels – across both the Alentejo and Algarve regions. It highlights significant typological variety on multiple levels, including construction techniques, vault morphology, and the spatial distribution of vaults within buildings – an aspect already touched upon in the previous article. Most importantly, the authors tackle a complex and often debated issue: the chronology and diffusion of vaulted structures. In so doing, they critically challenge the long-standing myth of an Islamic origin for these vaults, a notion that is contradicted by the currently available evidence.

The knowledge gathered from examples surveyed in the area studied also highlights two key challenges addressed in the following article, the result of a collaborative effort among several and multidisciplinary members of the project team (Mafalda Batista Pacheco, Ana Paula Falcão, Maria da Glória Gomes, Rolando Volzone, Marina Parreira Folgado, and Sérgio Costa). 'Digital vaulted territories: development of a cross-tool platform for vaults' knowledge' discusses, on the one hand, the need to record, organise, and manage data storage platforms to ensure the reliability of quantitative analyses, while also facilitating open-access data sharing with the academic community and other audiences. The article also examines the use of digital tools for the surveying, representing and monitoring of this built heritage.

Closely tied to the need for accurate graphic surveying tools for research, Luís Mateus' article, 'From the empirical making of alentejo vaults to the generative geometry of the Arco da Rua Augusta vault', examines the application of digital surveying methods across different cases. The study demonstrates how modern surveying and graphic reconstruction techniques allow for a precise assessment of the irregularity and geometric uniqueness of vernacular vaulted constructions, in contrast to the precision of stereotomy in more sophisticated examples.

The need for rigorous studies employing technological tools underscores the ultimate goal of all surveys: the conservation of built heritage, whose material existence serves as a historical record in itself. In this context, this issue includes two complementary pieces: an interview and the presentation of two documentaries.

The interview with Manuel Fortea Luna, project consultant and specialist in ver-

nacular vaults of the Spanish South, captures diverse perspectives on the material reality of these construction systems. Drawing from extensive experience in heritage consultancy, intervention, construction trials, and model-based simulations, Fortea Luna provides valuable insights into both the theoretical and practical aspects of vault building. The same concern – balancing the need to document surviving construction knowledge with the urgent demand for conservation and restoration of many identified examples – led to conversations with master vault builders. These discussions resulted in two documentaries: *Na obra com os mestres abobadeiros* (On the Work Site with Vault Builders) and *À conversa com os mestres abobadeiros* (Talking with Vault Builders), from which we present a short film teaser of the same name in this issue.

Thus, bridging the theoretical knowledge preserved in books to the still-living craft of vault building, this research paves the way for future studies in Art and Architectural History. It provides valuable contributions to Heritage Studies, which must inevitably be pursued through a multidisciplinary and institutionally diverse approach. This research also highlights the need to expand the study to regions of Spain, further broadening the scope of investigation.

We must also clarify an important and challenging editorial decision. For this issue, we collectively chose to present all materials exclusively in English. While this may seem paradoxical – given that both the authors and the subjects studied are largely connected to Portuguese reality – we deemed it essential within the editorial framework of *Revista de História da Arte* to facilitate broader discussion and comparative analysis beyond the Iberian world and Portuguese-speaking readership. The translation of technical vocabulary posed a particular challenge, demanding careful study and meticulous attention. Nonetheless, ensuring the widest possible dissemination of the research remained our top priority. Unless otherwise noted, all translations are our own responsibility.

Finally, we extend our gratitude to all the authors who contributed to this issue with their valuable work, as well as to the reviewers for their generous participation in the scientific evaluation of the articles. We also sincerely thank the *Revista de História da Arte* editorial team for their trust and support throughout the editorial process – first under the guidance of former editor-in-chief Basia Sliwiska and later with editor-in-chief Madalena Matos. To all, we remain deeply grateful.

Margarida Tavares da Conceição,  
Mafalda Batista Pacheco,  
João Vieira Caldas.

## References

- Fidalgo, Carlos. 1998. *As Abobadilhas de Tijolo*. Lisbon: LNEC.
- Genin, Soraya, Krista De Jonge and J.C. Palacios Gonzalo. 2009a. 'Portuguese vaulting systems at the dawn of the early modern period: between tradition and innovation.' In *Proceedings of the Third International Congress on Construction History*, vol. 2, 671-678. Cottbus: Brandenburg University of Technology.
- Genin, Soraya M. and Krista De Jonge. 2009b. 'Concepção e construção de abóbadas nervuradas análise geométrica e formal.' In *Actas del Sexto Congreso Nacional de Historia de la Construcción Valencia*, ed.s Santiago Huerta et al. Madrid: Instituto Juan de Herrera.
- Genin, Soraya. 2014. 'Voûtes manuélines. Le caractère innovant de João de Castilho.' Engineering. PhD thesis, Katholieke Universiteit Leuven.
- Rei, João, and António Sousa Gago. 2016. 'Abobadilha Alentejana, características e processos construtivos.' In *Segundo Congresso Internacional de História da Construção Luso-Brasileira, Culturas Partilhadas*, eds. R. F. Póvoas and J. Mascarenhas-Mateus, vol. 1, 91-105. Porto: FAUP.
- Rei, João, and António Sousa Gago. 2018. 'Abobadilha Alentejana – uma técnica construtiva tradicional.' In *RPEE – Revista Portuguesa de Engenharia de Estruturas* (Serie 3) 6: 27-40.
- San Nicolás, Lorenzo de. [1639/1665] 1796. *Arte, y uso de arquitectura* (...) – *primera parte* (...) segunda parte. Madrid: Placido Barco Lopez.