# Chapter 21
# Emilio Camps Cazorla and the Search of a Geometric Ratio for Islamic Architecture

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## ABSTRACT

*Islamic architecture has always been surrounded by an exotic aura which usually shows an impression of fanciful and exuberant forms as those romantic images suggested in stories like "The Arabian Nights" or "Tales of the Alhambra". In architecture, this vision lead to studies more concerned on ornamentation or historical chronology of the buildings than its own proper architecture. Facing this view, there is a number of studies attempting to find a geometric reason for that architecture, which could not only analyse the ornament individually but also look for a formula able to explain how spatial, ornamental and constructive compositions remain constant along time. Emilio Camps Cazorla was one of the first theorists in searching that geometrical ratio which he called "Caliphal module". Previously some authors had investigated the same subject and many others did after him, with mixed results. This paper documents all initiatives taken in order to determine this geometric ratio, their common characteristics as well as aspects to consider for future studies.*

*A Certainty, rather than a suspicion, has given birth to this work: that composition in Western Muslim Architecture, considering every functional and decorative aspect, cannot simply follow a more or less fantastic caprice, but had to have its own laws. And, if regarding to them we have no other evidence except the monuments themselves, a conscientious and objective analysis of them may make us discover their essential rules. (Camps Cazorla, 1953: 11)*

## INTRODUCTION

Islamic architecture has always been surrounded by an exotic aura as a result of a romantic vision fascinated by its exuberant ornamental display, which made it the perfect setting for fantastic oriental

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tales. However, this voluptuous image usually hides a powerful geometric composition that has been unperceived by scholars who were more concerned with the necessary chronological and ornamental classification of Muslim Art and Architecture. This is not a causal relationship, as mathematics and geometry were a major pillar for Islamic science during the Middle Ages, when both Greco-Roman and Oriental tradition merged and our current algebra and number scheme were provided. And like in classical tradition, is more than likely that the knowledge on these fields might have decisively influenced in architectural composition mechanisms.

Although there are not many direct references to the architectural practice in Islamic sources, it's possible to establish a relationship between abstract mathematics and geometry and the final form of many architectural elements, as it is possible to establish a formal evolution of architectural or ornamental elements from a set of primary elements. Thus, form and geometry combine themselves to produce architecture and decorative arts in the same way they did in classical antiquity, as Islam, in its beginnings a mostly nomadic culture, expanded at the expense of former Roman, Byzantines and Persians territories from where eventually took their different traditions. This relationship must be considered empirical in the absence of both period writings directly related to architecture, and a sufficient number of building traces to corroborate them. This absence has been a deterrent to scholars who preferred to remain in a more comfortable chronological and stylistic sphere instead of going into a field where precision errors can lead to theories which go beyond the study of an enclosed reality and try to define universal criteria from points of view that are near the limit of esotericism. One of the few authors whose researches seem to have rigorously analysed this relationship, to the point of finding a set of common geometric elements that complement and justify its stylistic evolution, is Emilio Camps Cazorla (1903-1952). Disciple of Manuel Gomez Moreno, whom with he collaborated at the University of Madrid, Camps published his first work on Islamic architecture in 1929 (Camps Cazorla, 1929), during the 1930's he set up his career with several publications on history of Spanish art. After the Civil War he became a collaborator at Instituto Velazquez, was appointed as Deputy Director of Lazaro Galdiano Museum as well as director of the National Archaeological Museum of Spain, a position he never hold as he died the same day of his designation.

Previously, Camps applied for the chairmanship of History of Art at the University of Oviedo, for which he made a preparatory exercise on proportions in Islamic architecture which would be eventually converted into a book published posthumously in 1953. This book, entitled "Módulo, proporciones y composición en la arquitectura califal cordobesa" (Module, proportions and composition in Caliphal Architecture in Cordoba) is the first attempt to approach Islamic architecture from a geometric point of view able by itself to explain the evolution of the horseshoe arch and its elements. This geometrical ratio binds the design of the arch and its elements to a triangle inscribed in its intrados, with the arch width as basis and its key as height. The different resulting triangles explain the arch evolution, or its changes, through history, although always maintaining a constant feature based in divisions into thirds.

This paper reviews that search for a geometric ratio in Islamic architecture throughout history, with special attention to the process followed by Camps in the composition of his book. The impact of Camps' studies as well as other subsequent attempts to define a geometric ratio, either from systems following Camps or other with their own criteria, is also discussed.