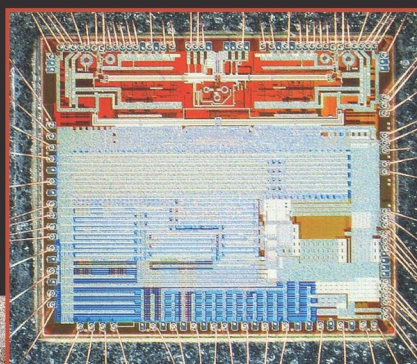


Edited by **Peter Gobets**  
and **Robert Lawrence Kuhn**

# The Origin and Significance of Zero

An Interdisciplinary Perspective



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## The Origin and Significance of Zero

Zero has been axial in human development, but the origin and discovery of zero has never been satisfactorily addressed by a comprehensive, systematic and above all interdisciplinary research program. In this volume, over 40 international scholars explore zero under four broad themes: history; religion, philosophy & linguistics; arts; and mathematics & the sciences. Some propose that the invention/discovery of zero may have been facilitated by the prior evolution of a sophisticated concept of Nothingness or Emptiness (as it is understood in non-European traditions); and conversely, inhibited by the absence of, or aversion to, such a concept of Nothingness in the West. But not all scholars agree. Join the debate.

## Numeration in the Scientific Manuscripts of the Maghreb

*Djamil Aïssani***Abstract**

In this paper, we begin by recalling the beginning of the mathematics of Islamic countries, particularly by emphasizing the influence of Indian arithmetic. Next, we present the particularity of the mathematics of the Muslim West (Maghreb and al-Andalus), by revealing the specificity of the digits and the symbolism used. Third, we focus on the role played by the city of Béjaïa (Algeria) in the 'popularization' of Arabic numerals in Europe, following the stay of mathematician Leonardo Pisano, or Fibonacci. The contribution of this article concerns the presentation of the numeration available in the Maghreb on the basis of the analysis of *Afraq n 'Ccix Lmuhub (Khizana* – the scholarly library of manuscripts of Sheikh Lmuhub). Discovered at Tala Uzrarin 1994, it is currently the only library of manuscripts cataloged in Kabylia (Algeria) (Aïssani, 2007; Aïssani, 2011).

**Keywords**

Muslim numeration – mathematics of Muslim West – Arabic numerals – Huruf al-Ghubar – symbolism – Maghreb – Béjaïa – Leonardo Fibonacci

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*Djamil Aïssani*

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## 1 Introduction

Since the twelfth century at least, it has been known that two families of figures were adopted by Muslim authors (Aïssani, 2018), both from Indian numeration. Their existence was attested as early as the twelfth century by the Maghrebian mathematician Ibn al-Yāsamīn (d. 1204), in his treatise *Talqih* (folio 7–8) (Abdeldjaouad, 2012).

The form adopted by the mathematicians of the Muslim West (Maghreb and Al-Andalus) gave birth to what are now called Arabic numerals, or Hindu-Arabic numerals. Ibn al-Yāsamīn had used a dust-covered calculation

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