



# The Universal History of Numbers: From Prehistory to the Invention of the Computer

By Georges Ifrah

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"Georges Ifrah is the man. This book, quite simply, rules. . . . It is outstanding . . . a mind-boggling and enriching experience." –The Guardian (London)  
"Monumental. . . . a fascinating journey taking us through many different cultures." –The Times (London)"Ifrah's book amazes and fascinates by the scope of its scholarship. It is nothing less than the history of the human race told through figures." –International Herald Tribune Now in paperback, here is Georges Ifrah's landmark international bestseller—the first complete, universal study of the invention and evolution of numbers the world over. A riveting history of counting and calculating, from the time of the cave dwellers to the twentieth century, this fascinating volume brings numbers to thrilling life, explaining their development in human terms, the intriguing situations that made them necessary, and the brilliant achievements in human thought that they made possible. It takes us through the numbers story from Europe to China, via ancient Greece and Rome, Mesopotamia, Latin America, India, and the Arabic countries. Exploring the many ways civilizations developed and changed their mathematical systems, Ifrah imparts a unique insight into the nature of human thought—and into how our understanding of numbers and the ways they shape our lives have changed and grown over thousands of years. "Dazzling." –Kirkus Reviews "Sure to transfix readers." –Publishers Weekly

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### Editorial Review

#### Amazon.com Review

The title doesn't lie. Mathematician Georges Ifrah's masterpiece, *The Universal History of Numbers*, is a wonderfully comprehensive overview of numbers and counting spanning all the inhabited continents as far back in time as records will allow us to look. Beyond the ancient Babylonians, Sumerians, and Indians, Ifrah takes us farther south into Africa to examine an early decimal counting system and into ancient Mexico to reconstruct what we can of the Mayan calendar and numerical system. The 27 chapters are chiefly organized by culture, though there are some cross-cultural overviews of topics like letters and numbers.

The author's aim was grand: "to provide in simple and accessible terms the full and complete answer to all and any questions ... about the history of numbers and counting, from prehistory to the age of computers." This led him to wander the world for 10 years, studying and learning; this scholastic pilgrim has returned with amazing stories to tell. Toward the end of the book, Ifrah makes the book truly universal by refuting alien-intervention theories of cultural origins--surely our benefactors would have given us an efficient decimal counting system, zero and all, before helping us build pyramids and such. Such charming ideas, combined with such rigorously researched facts, make *The Universal History of Numbers* a uniquely important and fascinating volume. --*Rob Lightner*

#### From Kirkus Reviews

Ifrah's monumental follow-up to *From One to Zero* (1993) goes from one to (almost) infinity as he meticulously reviews the numbers and reckoning systems of countless tribes and cultures in a dazzling scholarly performance. ``Performance'' is the operative word here, for not only does Ifrah enumerate the words and symbols used for arithmetic, but he also explains how to use each system, providing illustrations, diagrams, riddles, and puzzles. Indeed, nearly every page displays handsome numerals, counting devices, and illustrations of their use. Ifrah takes the human body as the aboriginal point of reference for most counting systemsfingers and toes producing systems using 5, 10, or 20 as a base. But 12, 60, and 360 have also been used, usually by cultures that attached more importance to the sky than to their anatomy. Ifrah gives special credit to the Mayans for their extraordinary adeptness at astronomical measurements, which calculated the length of the solar year as 365.242 days and the month at 29.53086 days. He commends India for the invention of zerothe placeholder in counting systems that use positional notation to indicate the different values, for instance, of 1, 10, and 100. A recurring theme is the intimate relation between number systems and written language. Just as the invention of alphabets allows the generation of myriad words, advanced number systems can use a limited number of symbols to represent any large number. A quibble or two: Ifrah frequently asserts that our brains cannot instantly number a collection of more than four objects, though psychologists maintain we can recognize up to seven objects without counting. And since many statements on the origins of systems and borrowings across cultures are speculative, they are subject to change in light of recent discoveries. A must for any libraryand a wonderful gift for anthropologists, ethnographers, cultural historians, and quiz kids. (Over 150 b&w drawings) (Book-of-the-Month Club selection; History Book Club selection; Quality Paperback Book Club selection) -- *Copyright ©1999, Kirkus Associates, LP. All rights reserved.*

#### Review

"A story where numbers and calculation serve as the thread tying together humanity's intellectual epic. The story of how-from the hand (the first calculator) to the computer, from notches cut on reindeer bones by prehistoric man to the binary system underlying today's information sciences-humankind has counted,

classified, compared and calculated everything." -- *Le Point*

"Georges Ifrah is the man, and this book, quite simply, rules. Forgive the gibbering lapse into the demotic, but more considered responses would hardly do justice to this book's scope, learning, and depth... It is outstanding, and not least because it has been written from first principles, for people like you and me, curious but by no means experts. It is a mind-boggling and enriching experience." -- *The Guardian*

"Ifrah's book amazes and fascinates by the scope of its scholarship. It is nothing less than the history of the human race told through figures." -- *International Herald Tribune*

"Ifrah, known in France as the Indiana Jones of numbers, has traveled to Cairo, Baghdad, Beijing and Philadelphia, visited the ruins of Pompei and the Mayan pyramids of Quiringua collecting information and evidence on customs, past and present, in the history of numbers.... To this teacher, numbers are poetry." -- *El País*

"The French are known for their interest in writing, but the stellar success of Georges Ifrah's *Universal History of Numbers* shows they are also passionate about math. Dive into the least anticipated-and most captivating-of bestsellers.... Its success reveals humankind's fascination with the mystery of numbers." -- *Le Nouvel Observateur*

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