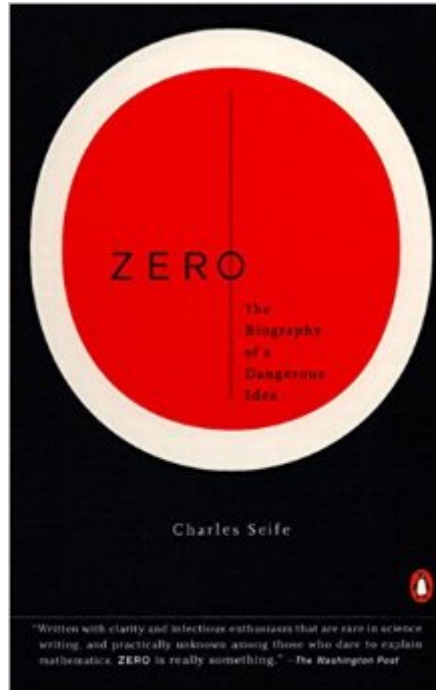


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# Zero: The Biography Of A Dangerous Idea



## Synopsis

The Babylonians invented it, the Greeks banned it, the Hindus worshiped it, and the Church used it to fend off heretics. Now it threatens the foundations of modern physics. For centuries the power of zero savored of the demonic; once harnessed, it became the most important tool in mathematics. For zero, infinity's twin, is not like other numbers. It is both nothing and everything. In *Zero*, Science Journalist Charles Seife follows this innocent-looking number from its birth as an Eastern philosophical concept to its struggle for acceptance in Europe, its rise and transcendence in the West, and its ever-present threat to modern physics. Here are the legendary thinkers— from Pythagoras to Newton to Heisenberg, from the Kabbalists to today's astrophysicists—who have tried to understand it and whose clashes shook the foundations of philosophy, science, mathematics, and religion. Zero has pitted East against West and faith against reason, and its intransigence persists in the dark core of a black hole and the brilliant flash of the Big Bang. Today, zero lies at the heart of one of the biggest scientific controversies of all time: the quest for a theory of everything.

## Book Information

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## Customer Reviews

I've recently read both Charles Seife's "Zero: The Biography of a Dangerous Idea" and Robert Kaplan's "The Nothing That Is: A Natural History of Zero." They are at the same time very similar and very different. They each follow an almost identical line, presenting the evolution of zero chronologically, and they each make almost identical stops along the way. The difference is in how they treat the steps in zero's evolution which is conditioned by their differing metaphysical views. An illuminating example is how they each treat Aristotle's role in zero's history. Charles Seife, from the

beginning, reifies zero: the author accepts the misconception that zero is some sort of actually existing mystical force resting at the center of black holes. He doesn't step back to take a look at the concept as concept. Nor does he appear to keep in mind that mathematics is the science of measurement, or that time is not a force or dimension, but merely a measurement of motion. This distorts his perspective, from which he attempts to refute Aristotle's refutation of the existence of the void: for Seife, zero exists and is a force in and of itself. In Seife's hands, zero certainly is a dangerous idea! Robert Kaplan, on the other hand, delves deeper. His work is informed by an obvious love for history and classic literature, and while this results in many obscure literary asides, one feels that this book takes part in the Great Conversation. As a result he steps back and takes a critical look at the true meaning and usefulness of the concept as a concept. Is zero a number? Is it noun, adjective, or verb? Does it actually exist outside of conceptual consciousness or is it exclusively a tool of the mind?

This book is about the history of zero, from ancient times to modern concepts. It's quite interesting and encompasses a lot of mathematics and philosophy as well as a bit of physics. Although the book reads well, is nicely documented, and extensively researched, the author has a style that I found aggravating; his frequent use of poetic hyperbole. This limits the book's value for someone unfamiliar with basic concepts in mathematics and physics. I'm not sure why Seife choose this style. There seems to be a movement (hopefully short lived) among science writers to dress up science and mathematics in poetic, flowery language. Whatever the reason, science has good reason to use strict meanings for words and a disciplined approach to scientific concepts. When authors poetically use words in technically incorrect ways they can make the prose pretty, but they often create confusion. For example, Saif says "Zero and infinity are eternally locked in a struggle to engulf all the numbers. Like a Manichaeon nightmare, the two sit on opposite poles of the number sphere, sucking numbers in like tiny black holes." [p. 145] From a mathematical point of view this is pure gibberish. If one's intent is to educate others about mathematics, such poetic hyperbole is not only useless, but counter productive as well. For folks who don't already know a bit about mathematics, Seife's book is as likely to confuse as to educate. For those who already understand the concepts, the poetry might be pleasing, but from an educational point of view the hyperbole found throughout this book is a definite stumbling block. Another problem I had with this book is the way Seife misstates some key aspects in modern science.

Quite a few books recently have chosen the history of zero and the vacuum as their subject, and

Seife's book is the clunker of the group. He has the dubious honor of bringing a tabloid style to math writing; his pages are replete with hyperbole and lame puns, as well as sometimes potty-mouthed in-jokes about mathematicians and various historical personages (Martin Luther in particular) that simply do not belong here. This might be a pardonable sin, but Seife combines this problem with two others that are less forgivable-- frequent errors and outright arrogance. I could go on at length, but a review in the Notices of the American Mathematical Society captures the problems best. (...) As Gray points out in the review, Seife says contradictory things about the Mayan calendar, in one place claiming that it is more consistent than the Gregorian (by including a zero year in the calendar) but then showing how the mixing of 3 different calendars led to confusion about the days. At one point the book also notes how zero was an ancient concept beginning thousands of years before the first civilization, but later suggests it started just a few centuries before Christ in the Fertile Crescent. Seife's book is full of these maddening little errors, which together suggest that he was not thorough in his research and proofreading. Seife's discussion of the history of calculus is woeful, as Gray further notes. Seife conflates the history of Newtonian calculus with its representation in differential equation form, and exaggerates the importance of the indeterminate expression--  $0/0$ -- and its confrontation via L'Hopital's rule, in establishing the foundation of the calculus.

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