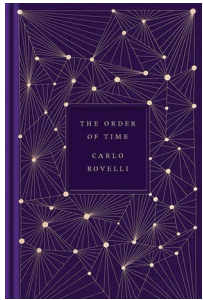


In our time



The Order of Time

by Carlo Rovelli

ALLEN LANE: 2018.
224 PP. £12.99

Theoretical physicist Carlo Rovelli has recently gained popularity as the author of the very successful bestseller *Seven Brief Lessons in Physics*. Lesson six is likely to have captured the imagination of some of the million plus readers, claiming — perhaps controversially, for its broader readership — that the past behaves like the future in absence of heat. Rovelli's extended thoughts on the matter of time and how we perceive it are the subject his latest book, *The Order of Time*, which has now been translated into English.

A physicist picking up a popular science book about time would have a relatively easy time predicting its cast of characters. Newton and Einstein would probably dominate the scene, but the likes of Boltzmann, Kant and Aristotle would also be expected to make an appearance. The plot twists would be equally unsurprising: one twin would have years on his sister when they meet again, and the mathematical variable representing time would all but vanish from the fundamental equations of quantum gravity. Spoilers aside, in my opinion *The Order of Time* brilliantly overcomes these pitfalls by engaging its readers at a level that goes deeper than physics.

Pretty early on in the book, one realizes that, in fact, *The Order of Time* isn't really a book about time. It's a book about us.

Rovelli peels off, layer by layer, all those intuitive ideas about time that physics teaches us are falsehoods. Although many readers will be familiar with some of them, like the fact that time isn't universal, and trained physicists with most of them, the narrative itself is compelling. Familiar concepts and characters are presented with such human warmth, simplicity and sensitivity that I couldn't help but feel immediately connected — at a profoundly human level, long before an intellectual one — to both the author and the topics he

discusses. It's a sensation that is impossible not to enjoy, and the credit goes to Rovelli's writing style, which often exhibits the child-like ingenuity of Italo Calvino or Carlo Collodi.

Rovelli clearly isn't one to leave his reader to cope with hard scientific truths alone. True, he takes us on a ride that might well shatter the innate notions of what time is for many a reader. And in doing so, he leads us to realize that the Universe is, in its essence, timeless. But these are lessons that can be learned from many other popular science books. Unlike the majority of those books though, Rovelli's doesn't read like a lecture: rather than teaching us the physics of time, he wants us to understand its implications for our lives and our perception of the world around us. So, by the final pages, the reader might come to realize that his understanding of time has not changed much after all. What may well have changed, though, is its context: Rovelli makes clear the idea that time isn't a notion hardwired in nature. It's hardwired in us.

Time remains an active field of research in physics. Indeed, it's one of the key issues standing in the way of unifying quantum mechanics and general relativity. This is noticeable in the book, where ideas from quantum gravity are noticeably less mature than those originating in Einstein's discoveries. Rovelli is quite upfront in declaring that some of the concepts he discusses are currently conjectures — indeed, some come directly from his own theories — but there is a danger that many readers will miss the distinction between what's established physics and what's not. And although supporters of competing theories might find this blurring of lines distasteful, the details of Rovelli's angle on quantum gravity hardly seem crucial to the overall narrative of the book — particularly in light of its non-didactic tone.

This journey through time sometimes loses its clarity — particularly towards the end of the book. The emotionally charged writing, though a welcome demonstration that physicists aren't just living computers, occasionally comes across as forceful and mawkish. An example is the representation of things and events, respectively, as stones and kisses.

But in general, Rovelli has a nice habit of blending of scientific and non-scientific sources. This is a refreshing reminder that knowledge need not be compartmentalized,



Credit: Jamie Stoker

a tendency that he described as 'schizophrenic science' at a recent book event organized by *The Guardian* newspaper in London. But invoking Husserl or Heidegger in a few sporadic quotes inevitably runs the risk of sounding shallow for the sake of it, rather than seriously contemplating their thoughts on time. A similar criticism could be extended to Rovelli's references to eastern mystic texts, which leave something of an odd taste in light of the fact that *The Tao of Physics* goes unmentioned.

The Order of Time is ultimately a book that will fascinate many readers. The nature of the topic prompts fundamental existential questions — from what it means for something to exist, to the very notion of causality. But the book does a great job of avoiding them head-on while providing suitable references. In this way, Rovelli constructs a window into one the deepest mysteries of nature and humankind, which will no doubt be appreciated by anyone who cares to have a look. And in doing so, he renews the legacy of physics as a fundamental way of making sense of our perception of the world.

Federico Levi

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