

## **“The order of time”**

### **Author**

Carlo Rovelli was born in Verona, Italy, on 3 May 1956.

In the 1970s, he participated in the student political movements in Italian universities. In conjunction with his political activity, he was charged, but later released.

Rovelli has credited his use of LSD at this time with sparking his interest in theoretical physics, saying of his experience: “it was an extraordinarily strong experience that touched me also intellectually... Among the strange phenomena was the sense of time stopping. Things were happening in my mind but the clock was not going ahead; the flow of time was not passing any more... And I thought: ‘Well, it’s a chemical that is changing things in my brain. But how do I know that the usual perception is right, and this is wrong? If these two ways of perceiving are so different, what does it mean that one is the correct one? He is currently a professor of theoretical physics at a university in Provence. He researches quantum gravity.

### **Book publishing**

The order of time was published in English in 2018.

The title is attributed to Anaximander, a Greek philosopher who said that things develop in the order of time.

It has also been released as an audiobook read by Benedict Cumberbatch.

In 2023 a Belgian-Italian film of the same name was released in 2023 loosely based on the book but featuring a group of friends faced with a few hours to live and their perception of time passing.

### **Book content**

The Order of Time is divided into three parts, covering the theory of relativity, space-time, and thermodynamics.

The first section, The Crumbling of Time, relates how a study of time is like holding a snowflake, our understanding melts and vanishes. Time varies with altitude, time is different for every point in space. Only heat creates a distinction between past and future. Every other phenomenon is reversible. This irreversible accumulation of heat is called entropy. Entropy is the increase of disorder although it only seems this way to our “blurred” vision. Speed slows time. So, for any point there are many “times”, there is no now. There is only the present for us. He presents the concept of cone shapes to represent our limit of perception and how this relates to others perceptions. Does time only measure change or does time run without change occurring? Is a point defined by its surroundings or does it exist without surroundings? This can be answered by space-time which is distorted by masses and fields around it. Quantum mechanics rules that we consider quanta of time, and gravitation exists only when it interacts.

In the second part, *The World without Time*, tried to explain how we should now consider time. He writes that events constitute the universe rather than things. That relationships between events constitute reality.

In the final section Rovelli suggests a naïve picture of time is suitable for everyday life but that leaves us with the mystery of time, and anxiety. Physics may help but maybe we should simply enjoy our time, our existence. He makes an excursion into his own philosophy of how to use the time we have.

### **Book review**

There are many books on quantum mechanics and relativity. Rovelli sets out to create an accessible level book It is not too long, with lots of examples and it tries to have a light touch. Repeated summaries help to give a grounding before the next concept is introduced. Some have praised his poetic style, he certainly has an attractive literary style. He is also open to share his own reflections and philosophies.

I wanted the book to work to help ameliorate the thesis of two cultures, suggested by C P Snow in 1959, that science and the humanities which represent "the intellectual life of the whole of western society" had become split into "two cultures" and that this division was a major handicap to both in solving the world's problems. But by explaining and making science accessible the barriers will diminish.

Is it successful? The concepts are so counter-intuitive that a lot of mental effort is required to follow his arguments and some prior knowledge is a great advantage. For me it was partially successful. I found I was constantly going back and forward in the book to help grasp concepts but some just eluded me. Blurred vision" with respect to entropy remains a mystery. However, I did feel at the end of the book that a storm had passed. A storm that dismantled preconceptions about time and left a confused scientific landscape. But, Rovelli does give us a way forward. If we can't understand this landscape and fail to impose order then that maybe we should simply accept being human and enjoy the flow of emotions as time passes.