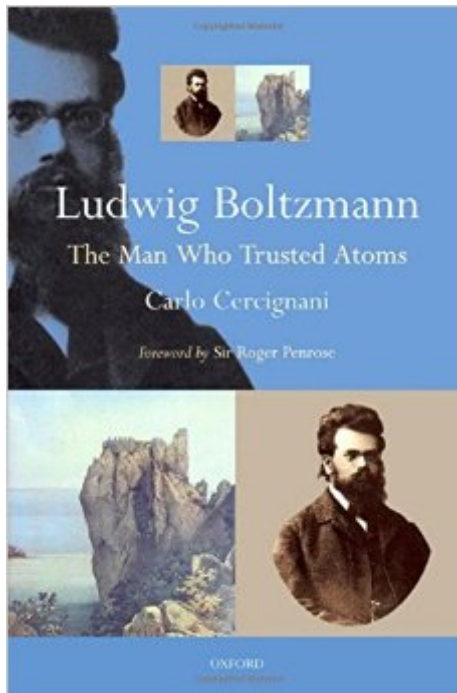


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# Ludwig Boltzmann: The Man Who Trusted Atoms



## Synopsis

Ludwig Boltzmann arguably played the key role in establishing that submicroscopic structures underlie the ordinary world. He had a tremendous impact on late 19th-century and early 20th-century physics, and he anticipated many contemporary ideas, including Kuhn's theory of scientific revolutions and recent theories of knowledge based on Darwinian principles. This book is the first accessible biography of this important figure. Without relying on equations, it provides a deep look at the full range of his scientific and philosophical ideas, discussing both their original context and their relevance today. The book also gives a concise portrait of Boltzmann's life, which, despite his successes, ended tragically in suicide. Drawing on recent research related to some of Boltzmann's more controversial ideas, this book offers fascinating insights into the birth of modern physics.

## Book Information

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## Customer Reviews

Cercignani provides a stimulating biography of a great scientist. Boltzmann's greatness is difficult to state, but the fact that the author is still actively engaged in research into some of the finer, as yet unresolved issues provoked by Boltzmann's work is a measure of just how far ahead of his time Boltzmann was. It is also tragic to read of Boltzmann's persecution by his contemporaries, the energeticists, who regarded atoms as a convenient hypothesis, but not as having a definite existence. Boltzmann felt that atoms were real and this motivated much of his research. How Boltzmann would have laughed if he could have seen present-day scanning tunnelling microscopy

images, which resolve the atomic structure at surfaces! If only all scientists would learn from Boltzmann's life story that it is bad for science to persecute someone whose views you do not share but cannot disprove. One surprising fact I learned from this book was how research into thermodynamics and statistical mechanics led to the beginnings of quantum theory (such as Planck's distribution law, and Einstein's theory of specific heat). Lecture notes by Boltzmann also seem to have influenced Einstein's construction of special relativity. Cercignani's familiarity with Boltzmann's work at the research level will probably set this above other biographies of Boltzmann for a very long time to come.

Why are you here? Why are you looking for a biography about Boltzmann? If you are looking for a strong science biography with a lot of mathematical detail, then you'll want this book. The book is not just a historical biography but a mathematical one. For this purpose I would have given it 5 stars. However, I was looking for a biography in the same category as Lindley's "Degrees Kelvin" (William Thomson aka Lord Kelvin) or Mahon's "The Man Who Changed Everything" (James Clerk Maxwell). While much of the math is placed into appendices, chapters 4, 5, and 6 will be difficult for the typical science history reader. The first three chapters were wonderful and detailed the life of Ludwig Boltzmann. Before this book he was simply the guy who's name was attached to a constant (which is why I want to read more about him!). The back cover praise is extremely misleading-"...accessible to all..." "Much of the book will be interesting to the general reader." "I can warmly recommend the book to everybody who is interested in the history of science." Umm... no. If the second paragraph of my review is what you are looking for then I would suggest you try Lindley's "Boltzmann's Atom". While I have yet to read it, I did read his book about William Thomson/Lord Kelvin, "Degrees Kelvin", and really enjoyed it.

Those seeking an 'easy' read will likely need to turn to another resource. The level of exposition is consistently high. This is a well written, richly detailed assessment of Boltzmann's life and his science. The scholarship is impressive. Few publications achieve this historical symbiosis between a scientist's life and his scientific work. The book has a twofold presentation (stated in the preface): the main text is devoid of mathematical detail, however the Appendices (roughly 50 pages, at the end of the book) present technical elaborations of the subject. The book in its entirety could be used as a textbook for a course on statistical mechanics from an historical yet rigorous standpoint. (again, a stated aim in the preface). Chapter Six "Boltzmann's Relation and the Statistical Interpretation of Entropy" is a highlight, the author beautifully enunciates the explicit use of probability for a gas with

discrete energies. Chapter Seven, another pinnacle, examines Boltzmann's achievements in relation to Gibbs' approach to Statistical Mechanics. The Appendices present a wealth of detailed derivations and certainly deserve careful consideration from the reader. Quite a splendid accomplishment. A duplicity of achievements: modern considerations combined with historical accuracy. Professor Cercignani has amply fulfilled his goals.

This book is difficult to get through. Not particularly because of the complex subject matter described, rather because of the way it is presented. For example, the references are unnecessary since it is not a research paper. Secondly, there are constant references within the text such as 'in the previous chapter' or 'we will see in chapter 7' after almost every few paragraphs, which makes it quite annoying and detracts from the main points, while confusing the reader. If one can ignore these extra remarks and references, then it is a decent book. Overall, I was hoping for a better read.

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