



The Periodic Table: Its Story and Its Significance

By Eric R. Scerri

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The periodic table is one of the most potent icons in science. It lies at the core of chemistry and embodies the most fundamental principles of the field. The one definitive text on the development of the periodic table by van Spronsen (1969), has been out of print for a considerable time. The present book provides a successor to van Spronsen, but goes further in giving an evaluation of the extent to which modern physics has, or has not, explained the periodic system. The book is written in a lively style to appeal to experts and interested lay-persons alike.

The Periodic Table begins with an overview of the importance of the periodic table and of the elements and it examines the manner in which the term 'element' has been interpreted by chemists and philosophers. The book then turns to a systematic account of the early developments that led to the classification of the elements including the work of Lavoisier, Boyle and Dalton and Cannizzaro. The precursors to the periodic system, like Döbereiner and Gmelin, are discussed. In chapter 3 the discovery of the periodic system by six independent scientists is examined in detail.

Two chapters are devoted to the discoveries of Mendeleev, the leading discoverer, including his predictions of new elements and his accommodation of already existing elements. Chapters 6 and 7 consider the impact of physics including the discoveries of radioactivity and isotopy and successive theories of the electron including Bohr's quantum theoretical approach. Chapter 8 discusses the response to the new physical theories by chemists such as Lewis and Bury who were able to draw on detailed chemical knowledge to correct some of the early electronic configurations published by Bohr and others.

Chapter 9 provides a critical analysis of the extent to which modern quantum mechanics is, or is not, able to explain the periodic system from first principles. Finally, chapter 10 considers the way that the elements evolved following the Big Bang and in the interior of stars. The book closes with an examination of further chemical aspects including lesser known trends within the periodic system such as the knight's move relationship and secondary periodicity, as well as attempts to explain such trends.

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Editorial Review

Review

"Scerri tries to understand the construction of the periodic table within the context of the history of matter theories. ... He insists that it results from the collective work of many chemists." --Nature

"This book is a fine addition to the history and philosophy of chemistry, fields that Scerri himself has played an important role in developing."--American Scientist

"An absolutely gorgeous book. I put it on my bedside table and then stayed up half the night reading it - it is immensely readable." --Oliver Sacks, author of "The Man Who Mistook his Wife for a Hat"

"Eric Scerri's new book is a most appropriate work to mark the centenary of the death of Dimitri Mendeleev. The title-'The Periodic Table: Its Story and Its Significance'-gives a fair idea of the book's contents, and the author's approach and perspective are captured by his statement that he is concentrating on "the fundamental scientific and philosophical ideas that underpinned the evolution of the system." This, then, is a book about scientific ideas. Scerri does provide brief biographical sketches of each of his scientific protagonists, but biographical, social and cultural context rarely intrude into the narrative."--Seymour Mauskopf, American Scientist

"This book is an important contribution to the history of an important tool in the study of chemistry. Its clear history and interesting explanations of the philosophy of the elements will mean that it will be useful for all kinds of students of chemistry and general science."--Simon Davies

"By writing this book and describing his philosophy, Scerri has done us a great service. Every chemist should read this book."--Chem 13 News

"There are few aspects of the story of the periodic system that Scerri would not tackle and would not make exciting." --Istvan Hargittai, Acta Crystallographica

"As one of the pioneering scholars in the philosophy of chemistry, Scerri has produced a comprehensive new book on the history and philosophy of the periodic system, which surpasses van Spronsen's book, and the result is a good antidote to reasearches who claim that chemistry is now only a reduced science or a service science."--International Journal for Philosophy of Chemistry

"Only two monographs in English, by Francis Preston Venable and Jan W. van Spronsen...have dealt both in general and in detail with the history and evolution of the table and the problems that have developed in connection with it through the years...Scerri's volume, under review here, is a worthy successor to these classic tomes, for he has left no stone unturned in ferreting out information from articles, books and archives."--The Chemical Educator

"Eric Scerri is something of a rara avis. Scerri's philosophical orientation enriches the text by raising a number of thought-provoking issues...The book under review here is clearly and engagingly written and meticulously researched with 42 pages of notes." --Journal of Chemical Education

"The quality is not merely skin deep, there is a real scholarship inside...I would have been proud to have written this book rather than just contributing one image." --Education in Chemistry

"This is undoubtedly a book that every practising chemist and chemistry educator should read because of its far-reaching implications for understanding the nature of the periodic law and the challenges it presents to contemporary portrayals of the Periodic Table."

--Newsletter of International History, Philosophy and Science Teaching Group

"'The Periodic Table: Its Story and Its Significance' should be of great interest and value to chemists and particularly to those chemists who teach about what makes up us, our world, and our science." --Journal of Chemical Education

"Resembling a surreal checkerboard, the periodic table of elements has acquired a mythic significance in our time, as Ptolemy's spheres did in the Middle Ages. Yet the table did not fall from the sky. It has a very terrestrial history; a complex and fascinating one. A century after the death of Mendeleev, the Russian with whom the periodic table is most famously associated, Scerri relates that history in his clear and absorbing account. Especially intriguing are his ruminations on a quasi-philosophical question, which is grist for the mills of reductionists and anti-reductionists alike: Can chemistry be reduced to quantum physics?." --San Francisco Chronicle

"It is an extremely rare occurrence to have the privilege of reviewing a book that is truly the definitive work in its field: 'The Periodic Table' by Scerri is such a book." --Rayner Canham

"There are few aspects of the story of the periodic system that Scerri would not tackle and would not make exciting." --Istvan Hargittai, Budapest University of Technology and Economics

"Eric Scerri's first book is timely, fluently written, and full of interesting ideas." --Metascience

"This is undoubtedly a book that every practising chemist and chemistry educator should read because of its far-reaching implications for understanding the nature of the periodic law and the challenges it presents to contemporary portrayals of the Periodic Table." --Science & Education

"It is probably the best book about the best classification system ever constructed. It should belong to any library supporting teaching and research in Knowledge Organization." --Professor Birger Hjørland, Royal School of Library and Information Science

"It is a thought-provoking work in the history and philosophy of science, and for those with a true scholarly passion for chemistry, this book is definitely one to consider." --Journal of College Science Teaching

"By writing this book and describing his philosophy, Scerri has done us a significant service." --Structural Chemistry

"Scerri's book is scholarly and extremely well documented and, in large measure, fulfills its stated objective of establishing 'that one of the best ways to explore the relationship between chemistry and modern physics is to consider the status of the periodic system.'" --Current Science

"It is valuable for students and teachers in sciences, as well as in the philosophy, and any other discipline that has some reference to chemistry." --Ivan Jurani, University of Belgrade

"Scerri also deserves full credit for reminding the scientific as well as the historical communities that chemistry is a discipline with great ideas and philosophical implications that are just as fundamental and intriguing as those of physics." --Centaurus

From the Publisher
Pre-Publication Reviews.

"Written to a high standard of scholarship, "The Periodic Table" is the only book of its kind currently on the market, giving both an historical and philosophical perspective to the development of this key to the elements. The philosophical discussion Scerri weaves through its pages is rarely found in chemistry books, giving it a special quality that will appeal to the scientific community at large. In years to come it will be seen as essential reading for all who aspire to lecture and write on the subject." - John Emsley, author of "The Elements" and "Nature's Building Blocks"

"As the author of "The Periodic System of Chemical Elements: A History of the First Hundred Years" (1969), I consider Scerri's "The Periodic Table: Its Story and Its Significance" a worthy successor. I declare his new book a must, not only for all historians of chemistry and the other natural sciences, but also for the scientists and pupils thereof." -- Jan W. van Spronsen, author of "The Periodic System of Chemical Elements: A History of the First Hundred Years" "Few concepts are more important in chemistry than the periodic table, and Eric Scerri's book offers a wonderfully thorough, lucid, and provocative introduction for both chemists and the scientifically literate to this major cultural contribution. Anyone interested in the foundations of chemistry will take delight, inspiration, and information from this highly approachable book." - Peter Atkins, author of "The Periodic Kingdom", "Molecules" etc.

"The periodic table of elements is the family tree of stuff, and Eric Scerri's book tells the story of its evolution--through all the false starts and inspired insights, mutations and selections, driven by philosophy as much as calculation. Like any family story, it's a messy tangle of relationships--between elementary particles and between people. The ultimate question is philosophical: Does it all boil down to different configurations of hydrogen? Or is chemistry--and therefore nature--ultimately irreducible?" -K.C. Cole, Author of "The Universe and the Teacup: The Mathematics of Truth and Beauty" and "Mind Over Matter: Conversations with the Cosmos".

From the Author

My first solo book. I'm so glad it's been so well received. I would be delighted to answer any questions from readers. Please also see my website at

ericscerri.com

Users Review

From reader reviews:

Gwen Dawes:

The book The Periodic Table: Its Story and Its Significance gives you the sense of being enjoy for your spare time. You may use to make your capable more increase. Book can to become your best friend when you getting tension or having big problem using your subject. If you can make studying a book The Periodic Table: Its Story and Its Significance being your habit, you can get a lot more advantages, like add your capable, increase your knowledge about a few or all subjects. You are able to know everything if you like open and read a publication The Periodic Table: Its Story and Its Significance. Kinds of book are a lot of. It means that, science e-book or encyclopedia or other folks. So , how do you think about this guide?

Samuel Gorman:

Reading can called thoughts hangout, why? Because if you are reading a book specially book entitled The Periodic Table: Its Story and Its Significance your head will drift away trough every dimension, wandering in most aspect that maybe unidentified for but surely will become your mind friends. Imaging every word written in a book then become one application form conclusion and explanation this maybe you never get prior to. The The Periodic Table: Its Story and Its Significance giving you a different experience more than blown away the mind but also giving you useful data for your better life with this era. So now let us show you the relaxing pattern this is your body and mind will probably be pleased when you are finished examining it, like winning a game. Do you want to try this extraordinary spending spare time activity?

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