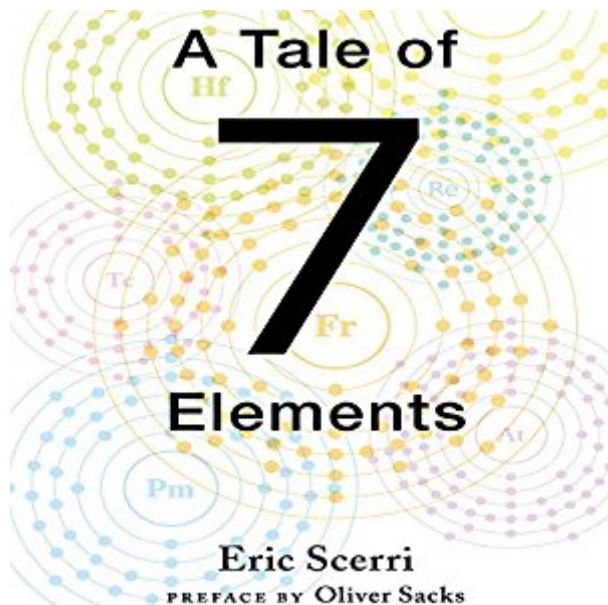


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# A Tale Of Seven Elements



## Synopsis

In 1913, English physicist Henry Moseley established an elegant method for "counting" the elements based on atomic number, ranging them from hydrogen (#1) to uranium (#92). It soon became clear, however, that seven elements were mysteriously missing from the line up - seven elements unknown to science. In his well researched and engagingly narrative, Eric Scerri presents the intriguing stories of these seven elements - protactinium, hafnium, rhenium, technetium, francium, astatine and promethium. The book follows the historical order of discovery, roughly spanning the two world wars, beginning with the isolation of protactinium in 1917 and ending with that of promethium in 1945. For each element, Scerri traces the research that preceded the discovery, the pivotal experiments, the personalities of the chemists involved, the chemical nature of the new element, and its applications in science and technology. We learn for instance that alloys of hafnium - whose name derives from the Latin name for Copenhagen (hafnia) - have some of the highest boiling points on record and are used for the nozzles in rocket thrusters such as the Apollo Lunar Modules. Scerri also tells the personal tales of researchers overcoming great obstacles. We see how Lise Meitner and Otto Hahn - the pair who later proposed the theory of atomic fission - were struggling to isolate element 91 when World War I intervened, Hahn was drafted into the German army's poison gas unit, and Meitner was forced to press on alone against daunting odds. The book concludes by examining how and where the 25 new elements have taken their places in the periodic table in the last half century. *A Tale of Seven Elements* paints a fascinating picture of chemical research - the wrong turns, missed opportunities, bitterly disputed claims, serendipitous findings, accusations of dishonesty - all leading finally to the thrill of discovery.

## Book Information

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## Customer Reviews

In the year 1900, 85 naturally occurring elements had been isolated and characterized. The new century had given rise to the identification of the halogens as members of the New Group 7 of the periodic table. Other recent discoveries, including radioactivity, the nature of isotopes, quantum theory, and atomic number ( the definitive and unique property of every element ), were all to play critical rolls in the search for new elements. Uranium ( atomic number 92 ) had been found in the nineteenth century. Uranium is the heaviest naturally occurring element, but that was not understood at the time. What WAS known was that Mosley's x-ray fluorescence analysis could characterize the atomic number of every element. Application of this analysis to the ( then known ) elements brought a gracious order to the periodic table - and it showed that verifiable GAPS existed at atomic numbers 43, 61, 72, 75, 85, 87, and 91, where new elements were to be found. The death of Mendeleev in 1907 opened the twentieth century style quests for the missing elements. These quests were prompted by the new scientific tools, nationalism, and the hope for professional glory. Yet they were hindered by unfounded eagerness to publish, experimental difficulties, and antagonisms toward German scientists following World War I. So . . . despite the new tools available, this new element quest was slow going, characterized by many retracted claims, misidentification of isotopes, and contentious ( but very polite ) priority battles in the chemical, physical and geological journals. The stories are every bit as exciting as those of the polar expeditions, medical breakthroughs, and artistic innovations taking place in this same time frame.

"A Tale of Seven Elements" centers on the historical tale of the last 7 elements to be discovered on the Periodic Table of Elements. For a reader of the history of elements, this book was a must have considering that there is very little published knowledge on the final seven elements or the exciting tale on how they were discovered. Dr Scerri did a wonderful job of keeping the facts straight while making those facts interesting to read and enjoy. The chase for these elements can be considered a scientific thriller once the reader realizes just how many different groups of scientists were trying to be the first to claim the right of being the discoverer, along with the national pride that comes with it. I would highly suggest this book to all chemists, students of science and those who are just looking for an interesting factual book on the process of discovery. Dr Scerri gives enough of a chemical background that even a novice in the field of chemistry can understand what is taking place, while giving enough details that those who come from a science background will not be bored.

As a chemist I found the book to be fascinating. As I studied for my chosen career in the 1950's I was always interested in Element 43 -- technetium. I wondered if it really did have some of the characteristics of manganese, Element 25. What is the color of pertechnetate? Is the color as intense as permanganate? Although this issue was not addressed, I still find it hard to believe that natural technetium is so limited. The radioactive elements were addressed and truly their discovery was described in great detail. Much different than the story of "Madame Curie" as depicted in the 1943 film. I was never sure why polonium was discovered before radium, and this fact became clearer in this book. I would recommend this book, to anyone who is interested in the evolution of the history of chemistry.

While working in the field of metallurgy for over 30 years, there have been certain elements I only knew as place markers on the periodic table. This book elucidates the search and discovery of these elements as well as the trials of many of those working in that area. I think the book would appeal mainly to those with some science background although the author focuses on what truly constitutes discovery as well as the fact that today there are few discoveries that are the result of only one person's work. I will probably order his book on the periodic table.

Dr. Scerri's book is an excellent read and on my recommended list. He gives a nice review of the development of the periodic table and the scheme chemists and physicists have used to discover and document the number of elements on our world. The prose is clear and to the point while being very fluid and accessible, I think, to all. He carefully provides the context and people who played all the important roles in our progress toward understanding the structure and number of elements found on our world and in the universe. Both those that occur naturally here as well as how and when the most recent have been created. The elements of this story's use are also nicely outlined. This is a must read for anyone with an interest in science and seeking a clear understanding of the human element involved in the business of science.

A basic understanding of the periodic table of elements will help the reader glean more from this fascinating book; however, the author makes it "user-friendly" enough for even the layperson to understand and enjoy. As a layperson myself, much of what I assumed about the history, creation and application of the periodic table and its elements was incorrect. Eric Scerri's ability to write succinctly while intuitively expounding upon clarification of terms and processes for those of us

without a B.S. degree in chemistry or physics makes it a thoroughly enlightening and pleasurable read. What separates this book from other like-minded books that are written for and marketed to the general public is that this one works. Scerri successfully combines the right proportions of history, chemistry and physics that is inter-woven with compelling story-telling that keeps the reader engaged and motivated to continue reading (even through difficult passages like one quote written in French (literally)).

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