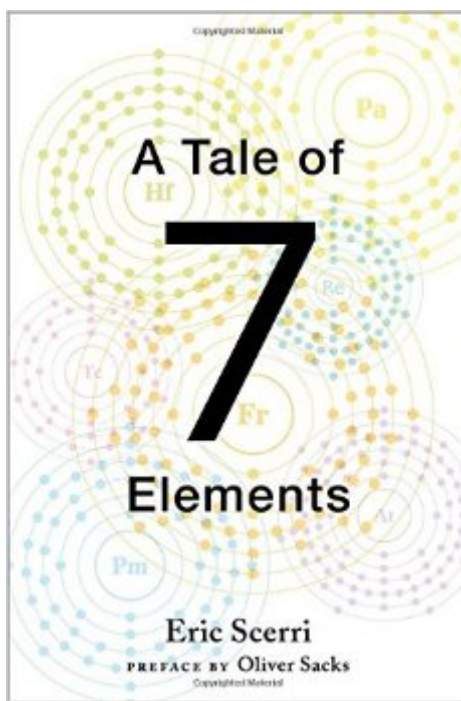


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# A Tale Of Seven Elements



## 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 lineup--seven elements unknown to science. In his well researched and engaging 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 twenty-five 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

During the 38 years that I taught chemistry, including lots of freshman chem, I was always on the lookout for sources that would help me give a little more human and historical perspective to chemistry than is found in the textbooks. Chemistry texts generally present a nice, neat, logical structure to the science that gives little feeling for all the inspired guesses, hard work, luck, mistakes, false starts, error correction, and ego bruising that went on in the process of developing that elegant and formidable structure. Prof. Scerri's book does an excellent job of providing this insight for one corner of chemistry--the filling in of the Periodic Table by the discovery of seven elements previously suspected but unknown. After an introduction to bring the non-chemist reader up to speed on the Periodic Table and the role that physics plays in its understanding, Scerri devotes a chapter to each of these elements in the chronological order in which it was discovered: protactinium, hafnium, rhenium, technetium, francium, astatine, and promethium. All seven of these elements have atomic numbers that fall in the range of 1 (hydrogen) to 92 (uranium), and were suspected to exist on the basis of gaps in the Periodic Table and on the basis of X-ray evidence first obtained by Moseley. Scerri describes the at times tortuous paths and the various false starts that eventually led to the discovery of each element, as well as the heated disputes that arose over questions of priority. The book ends with a chapter on the creation of the trans-uranium elements in nuclear reactors, H-bomb blasts, and high-energy particle accelerators. If you remember a fair amount of freshman chemistry or of a first-rate high school chem course you should find this book readily accessible--an easy read.

Quickly, what are technetium, promethium, hafnium, rhenium, astatine, francium, and protactinium? What do they have in common? Eric Scerri provides answers to these questions and many others in his recent book, "A Tale of Seven Elements" (2013). Dr. Scerri teaches chemistry at UCLA and specializes in the history and philosophy of science. Besides engaging in his own technical research, Scerri has written several books explaining difficult and important scientific principles to nonspecialist readers. He has written two introductory studies of the periodic table, *The Periodic Table: Its Story and Its Significance*; *The Periodic Table: A Very Short Introduction* in addition to this new, more narrowly focused book. Scerri's book discusses seven chemical elements, named above. But why, precisely, these seven and not others? Why not more familiar elements such as oxygen, carbon, gold, and more? And why not five elements, or eight? As the book unfolds, Scerri develops

the reasons for the focus. Understanding the background for the choice of the seven elements is at least as important to this book as is the individual treatments of each. After an extended introduction on the nature of science and scientific discovery, Scerri offers two background chapters on the historical development of chemistry. These chapters are critical to understanding the discussions of the seven elements that follows.

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