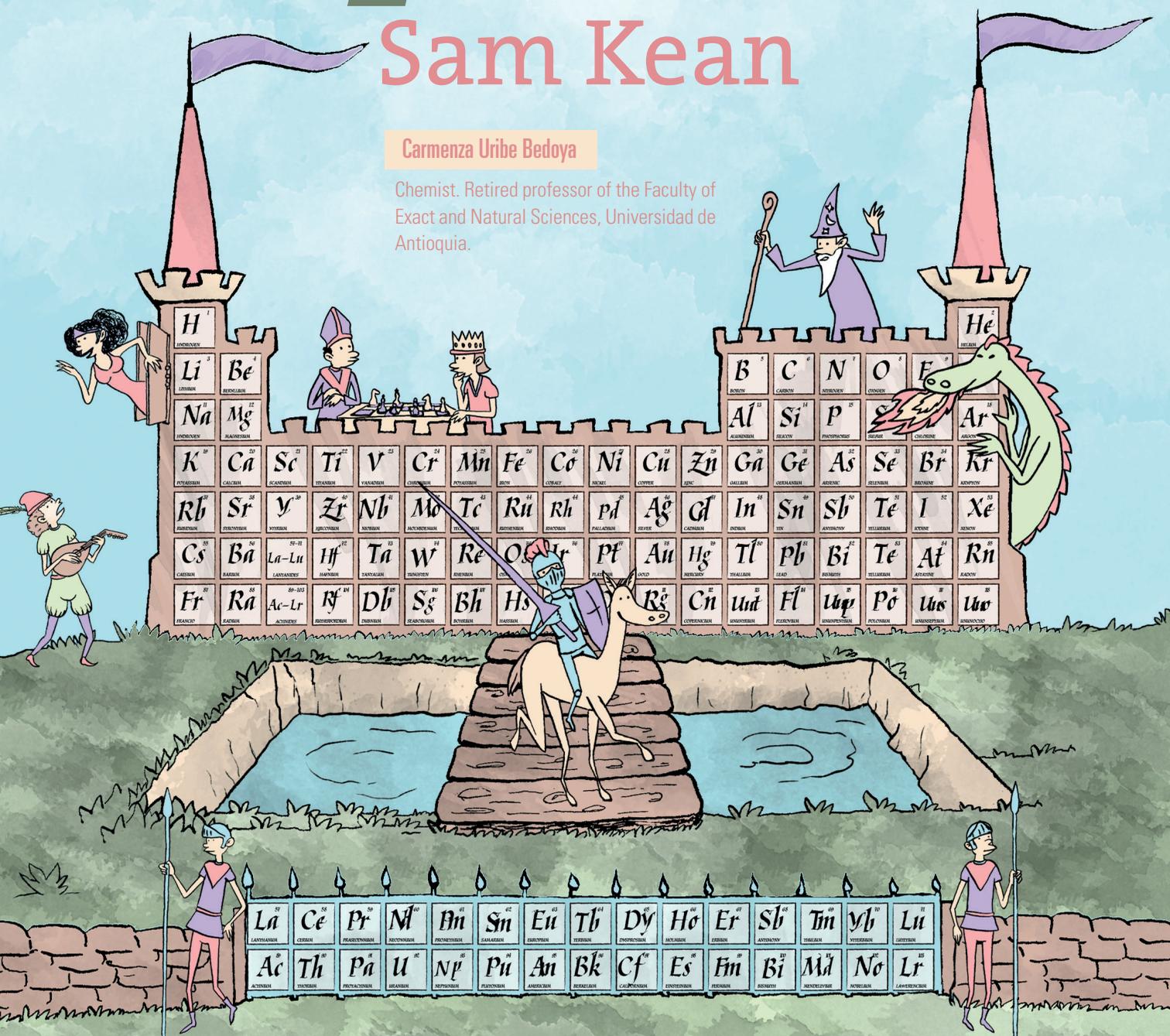


# The Disappearing Spoon

## Sam Kean

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e will always remember it hanging on the classroom walls, sharing the stage with maps or anatomy atlases.

We won't forget the mixture of fascination and helplessness that it inspired in us, or the time that went by between the moment that it was presented to us and the day we were finally able to use it correctly. The periodic table is a catalogue of all the kinds of matter in the universe. Its value resides in the orderly and summarized presentation of information about each known chemical element—one of science's best ever exhibitions of the ability to summarize. Perhaps, the best way to study the periodic table would be to remove all the information and start by describing its structure: a sort of castle with walls of different heights, as if the bricklayers hadn't finished their job, and two high

defense towers on either side. There are eighteen irregular columns and seven horizontal rows, apart from a couple of additional rows separated from the base. However, this wasn't always the case. The first version of the table had only 62 elements, arranged in a different way. The castle is made of brick. A particular feature of it is that no two blocks are the same, and each occupies a specific place. Today, we know that if one brick stopped being in its place, the whole castle would fall apart. Analogies of this type are abundant in *The Disappearing Spoon*, an enjoyable book by the American writer Sam Kean, whose scientific dissemination style has earned him multiple accolades. This is an indication that science can be disseminated by balancing the technical aspects, conveniently explained, with anecdotes, which are so appealing to any reader. The book's title refers to gallium, a metallic element that melts at 29.7 °C. This allows chemists to play pranks on their friends. They make gallium teaspoons and invite their friends over for a hot cup of coffee. Then, they enjoy the look on their friends' faces when the spoon melts. One of the first versions of the periodic table is attributed to an unsociable Siberian, the youngest of 17 children—Dmitri Ivanovich Mendeleev (Tobolsk, 1834-Saint Petersburg, 1907). He lost his father, but had a visionary mother

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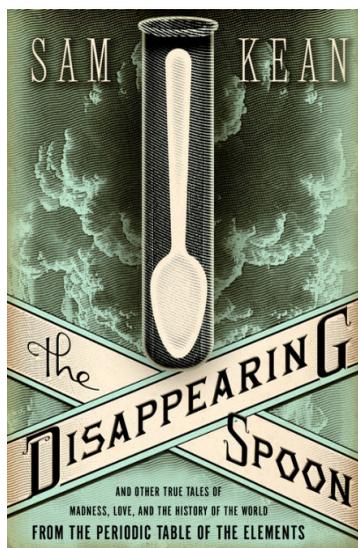
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who traveled with him thousands of kilometers to get him into college. Due to its importance, his work has been compared to Darwin's findings and Einstein's theory of relativity. His genius consisted in arranging the elements according to periodic properties and, especially, in leaving empty boxes with precise predictions about the properties of the elements that would take them. This was his particular way of seeing the future. As more elements were identified and their information fitted the predictions, the table was gradually consolidated. From the time of Mendeleev —whose table dates from 1869— until today, the table has been an inspiration for a vibrant scientific activity whose goal is always to give an identity to each box. Likewise, over 700 different forms of the table have been proposed, not all of which are flat. Some are circular, some are helical, and some are spiral. There is even a Rubik's cube whose faces are made of elements. Apparently cold and full of data, the periodic table is actually a place where diverse stories co-exist. The table contains the basic information and properties of each element, the possibility of interaction between them and the probability of molecule formation. It also includes the history of the scientists —some of them really mad— that devoted their life and even lost it to their discovery, apart from the tales about the countless



Cover of book *The Disappearing Spoon*, by Sam Kean. 2010.

manifestations of the presence of the elements in everyday life. Sam Kean makes a historical journey through the facts, anecdotes, characters, accidents and adventures that led to the knowledge depicted in the current periodic table of 118 elements, the last of which recorded in 2016. It is an appealing text, with a dose of good humor, that shifts between scientific dissemination and the history of humankind. It portrays the table as a true icon of science's universal language. Adolescents could be taught the periodic table through analogies, and Sam Kean's book features a good set of them. The table is a great map full of conflicting actors whose location grants them a distinctive personality. The far east is inhabited by the aristocratic noble gases. It is a demilitarized zone, but it has some troublesome and warlike neighbors—halogens. The generous alkali metals live in the far west. The plains in the middle are inhabited by the transition metals. There is an aisle of poisons. Oxygen is aggressive, antimony is a symbol of femininity, and carbon is promiscuous, thanks to which the compounds of life exist. Some radioactive elements kill us, but others save our lives. Some elements are useless, for example, polonium. It disintegrates so quickly that it is a mocking metaphor of Poland itself. Precious gold and silver have stirred ambitions and created conflicts. Some elements fool the organism, others have influenced politics and wars. Some mold our character and others inspire artists. However, the best thing about *The Disappearing Spoon* are the anecdotes and curious facts because, behind each element, there is an amusing, unusual or fascinating story. The names are an example of this. In a mine in Ytterby, a little village in Sweden, se-

<sup>1</sup> In 2010, when Sam Kean's book was published, the periodic table had 112 elements.

ven elements were discovered. They all have names related to that village or country: ytterbium, yttrium, terbium, erbium, gadolinium, holmium and thulium. Californium and berkelium are named after the University of California in Berkeley, where they were obtained. Only two elements are named after living scientists: seaborgium and oganesson. Others pay homage to dead scientists: mendelevium, curium and einsteinium. Some elements are named after countries or regions: europium, scandium and francium. Others are related to planets: neptunium, uranium and plutonium. There are element names that come from deities: titanium, iridium and thorium. Selenium is named after the moon, and helium, after the sun. By reading *The Disappearing Spoon*, we find out, for example, which gas behaves like a “kind murderer”—it familiarly waves at the body’s security systems as it goes by; the solitary metal that is usually found alone in mines and the one that always occurs mixed up with others; the best spermicide ever created; the metal that hypnotizes blood cells and doesn’t trigger any immune reaction, which means it fools the body “for its own good”; the sweet element that killed Enrico Fermi; the element considered the poisoners’ metal; the element that killed *Madame Curie* and the one that killed her daughter Irene; the elements used to ascertain the Earth’s birth date; lanthanide, which is the stuff of nightmares for euro forgers; the most ephemeral and fragile of all elements; the element with a half-life of approximately 19 quintillion years; the one considered the metal of war par excellence and the gas that was part of a substance synthesized to help Germany win World War II, to no avail; the small and effective element administered as a psychiatric drug; the one that drove Alice’s Mad Hatter mad and the ones that embellish oil paintings; the 92 found in nature and the 26 created in laboratories; the six that make up over 99% of our organisms and the tens of other elements that exist in traces but are essential to life, plus many more curious facts worth knowing. When you finish reading the book, it is clear that the periodic table embodies not only achievements but also frustrations in every field of human enterprise, and its history is scientific but also, and to no less extent, social. It is the history of our species written in a concise and elegant text. In summary, *The Disappearing Spoon* appeals to anyone, whether in the field of science or not. As Sam Kean states:

“We eat and breathe the periodic table; people bet and lose huge sums on it; it poisons people; it spawns wars. Between hydrogen at the top left and the man-made impossibilities lurking along the bottom, you can find bubbles, bombs, money, alchemy, petty politics, history, poison, crime, and love. Even some science.”

*The Disappearing Spoon: And Other True Tales of Madness, Love, and the History of the World from the Periodic Table of the Elements.* Sam Kean. 423 p. Ed. Planeta, Barcelona. © 2010.

<https://www.littlebrown.com/titles/sam-kean/the-disappearing-spoon/9780316051644/> ✕