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Book and Media Review

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Review of *The Lost Elements: The Periodic Table's Shadow Side*

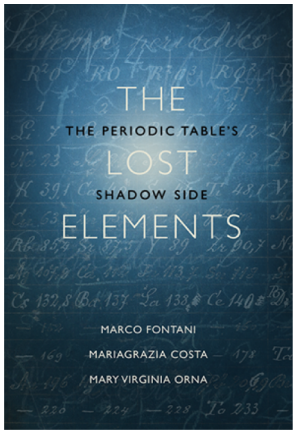
Jeffrey Kovac*

Department of Chemistry, University of Tennessee, Knoxville, Tennessee 37996-1600, United States

Lost Elements: The Periodic Table's Shadow Side, by Marco Fontani, Mariagrazia Costa, and Mary Virginia Orna. Oxford University Press: New York, 2014. 576 pp. ISBN 978-0-19-938334-4 (hardcover). $39.95.

Most of us love stories of discovery, adventures into the unknown. For chemists, the stories of the discoveries of the elements are great fun and often great inspiration. Who does not admire William Ramsey who was able to add a whole new column to the periodic table: the noble gases? But the real story is not quite as neat as it is usually remembered. It is not well known that Ramsey originally thought that argon was a mixture of three gases with almost identical atomic weights that he named, with patriotic fervor, Anglium, Scotium, and Hibernium.

This painstakingly researched new book, *The Lost Elements: The Periodic Table's Shadow Side*, by Marco Fontani, Mariagrazia Costa, and Mary Virginia Orna tells the stories of the more than 200 incorrect discoveries of elements. Some of these stories remind us that chemical separation can be difficult, as in the case of the rare earths, but also that many discoveries, later found to be false, are the result of wishful thinking on the part of the discover. Of course, there were also cases of scientific incompetence, rediscovery, and outright scientific fraud. All these stories as well as profiles of the sometimes-eccentric personalities of the people involved are recounted in clear and lively prose with copious references to the original literature.



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I was particularly interested in the chapter on the discovery of some "occult elements" using the powers of clairvoyance. The perpetrators were early founders of the Theosophical Society: Annie Besant, Charles Webster Leadbeater, and Curuppumullage Jinarajadasa. They not only claimed to have discovered several new elements, occultum, kalon, adyarium, and platinum-B, but also that by means of clairvoyance they could actually observe at least 59 elements directly. Had they been right, chemistry would be a lot easier. As an interesting footnote, they had some help in their research from Sir William Crookes, who was a member of the Theosophical Society for a while. Crooks provided them with pure samples of several elements. All of this occurred in the late-19th century when there was considerable interest in spiritualism and the occult, but all the discoveries by the Theosophists turned out to be nonsense, although it would be nicely poetic if a new metal had been discovered by a person named Leadbeater.

The Lost Elements is not a book to be read straight through. It consists of a large number of short chapters, arranged more or less chronologically, with excellent indices as well as a complete list of all the lost elements and their discoverers. Just scanning the list is a delight because you find such amusing names as demonium and incognitum. You might also find an element named for your home state, virginium or alabamine, or the country of your ancestors, bohemium or canadium. You can then go to the appropriate section and learn about an element that catches your fancy.

This is an important work of history because it shows that science proceeds not as an unbroken series of triumphs, but rather a complex mixture of failures and missteps along with the successes. It emphasizes the difficulty of classical chemical separation and analysis, a lesson that we should not forget even in this era of sophisticated spectroscopic techniques. The book also contains important ethical lessons, particularly the importance of not letting one's hopes and preconceptions influence the interpretation of the data. Sometimes you see only what you want to see.

Oxford University Press is to be commended for publishing an important and attractive book at an affordable price. *The Lost Elements: The Periodic Table's Shadow Side* is a book to be savored, read and reread, because it reveals the real history of chemistry in the form of adventure stories.

AUTHOR INFORMATION

Corresponding Author

*E-mail: jkovac@utk.edu.

Notes

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