so—it is certainly easier in the Second Edition than it was in the first. However, I would have liked entries in the Index that are not now there for example, on "caprolactam", "nylon production", and "single-site heterogeneous catalysts" (There are now 125000 entries in Google on the last of these topics); an author index would also have been helpful. It would also help the reader if the pages covered were included on the spine or cover of each volume.

On balance, the venture is an indisputable success: no laboratory—academic or industrial center—seriously interested in keeping abreast of the vast ramifying corpus of heterogeneous catalysis can afford not to have this series on its shelves. In an age when Wikipedia is instantly accessible online through Google, one wonders what kind of Handbook will be published when the time arrives for a third edition!

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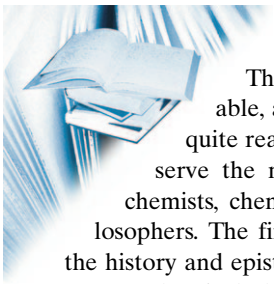


The Periodic Table

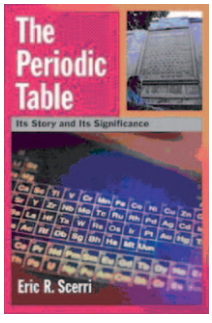
This is a well-written, readable, and interesting book at a quite reasonable price, which will serve the needs of many ordinary chemists, chemistry teachers, and philosophers. The first two-thirds deals with the history and epistemology of the Periodic System of chemical elements and its empirical aspects, in a very effective way. The theoretical chemical aspects in the last third are treated less appropriately.

The classical works on the Periodic System date back three to five decades. J. W. Van Spronsen celebrated a jubilee with *The Periodic System of Chemical Elements* (1969, reviewed in *Angew. Chem.* **1972**, *84*, 1113; *Angew. Chem. Int. Ed. Engl.* **1972**, *11*, 948). E. G. Mazurs systematized the then already 700 diverse *Graphic Representations of the Periodic System During One Hundred Years* (1957, 1974). The publication of individual papers on the Periodic System has boomed in recent years, in particular on the occasion of the 100th anniversary of Dmitrij Mendeleyev's death in 2007. During the intervening years since the earliest publications, the new discipline of the "Philosophy of Chemistry" has matured (with a periodic spiral as its logo, http://ispc.sas. upenn.edu). One of its fathers, Eric Scerri, now presents a suitably enriched monograph. Another important, although less comprehensive, text is R. M. Cahn's *Historische und Philosophische Aspekte des Periodensystems der Chemischen Elemente* (http://www.hyle.org/publications/books/cahn/cahn.pdf, 2002).

A real advantage of the present work is that some unfortunate, but often repeated, statements in chemistry textbooks are here presented more correctly. The author consistently makes a conceptual distinction between the Periodic Law, the Periodic System, and the individual Periodic Tables; also between chemical elements *in* compounds, as *basic* substances, and elementary *simple* substances. He carefully traces the slow birth of the Periodic Tables that occurred over an extended period, with many accoucheurs including Döbereiner, Chancourtois, Meyer, Mendeleyev, and others. He analyzes the more recent developments and the various graphical forms. Concerning the still debated question of whether a new theory is better promoted through the accommodation of many well-known facts or by the verification of some bold predictions (e.g., *Science* **2005**, *307*, 219–221; *308*, 1409–1412), the author proposes a more reasonable compromise. Scerri also does not hide the fact that Mendeleyev's predictions included not only his three spectacular successes (Sc, Ga, Ge) but also many that were simply wrong.

In other respects the author, a chemistry lecturer at the University of California at Los Angeles, adopts the common chemical textbook wisdom. Chemically bound elements are equated with single atoms in vacuum, and also the electronic state is equated with the electronic configuration. Concerning the transition-metal atoms, it is suggested that first the $(n+1)$s orbital is occupied by electrons, and only subsequently the nd shell, although the transition-metal cations have been known since the 1930s to possess only d valence electrons. The author correctly presents some aspects of the nd–$(n+1)$s issue, which is treated notoriously badly in the textbooks, but he still does not reach a correct resolution. Hence, absurd doubts about the fundamental applicability of quantum mechanics to atoms and molecules emerge, which may be appreciated by some chemists and philosophers. Unfortunately, many modern philosophers of chemistry disclaim the power of theoretical physics and quantum chemistry to explain and to deduce many chemical concepts and chemical laws.

This still young century has already produced a significant gain of new insights, relevant to both empirical and quantum-theoretical aspects (see the Essay on page 3404 in this issue). Regrettably, they were too recent to be incorporated into this book, although admittedly, Scerri's earlier contributions, which are integrated into the present book, had decisively influenced the recent advances. The



The Periodic Table
Its Story and Its Significance. By Eric R. Scerri. Oxford University Press, Oxford 2006. 346 pp., hardcover € 29.00.—ISBN 978-0-19-530573-6

book (at least the first two-thirds) can be warmly recommended to chemistry educators at all levels and to all open-minded chemists and students of chemistry. The remaining third can also be recommended to theoreticians, to familiarize themselves with the patterns of thinking of the yet "scientifically oriented" part of the community of philosophers. Anyhow, the book is a must for every library of the natural sciences.

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