

Editorial 26

Special issue on Mendeleev and the periodic system

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It is a great pleasure to say a few words, by way of introduction, to this first part of a two-part special issue to commemorate the one hundredth anniversary of the death of Dimitri Mendeleev the discoverer of the mature periodic system (Gordin 2007; Woods 2007).¹ Chemical periodicity has correctly been described as perhaps the ‘biggest idea’ in chemistry. Philosophical work on the nature of the periodic system and the elements has provided many recent contributions which lie at the heart of the new philosophy of chemistry. Some of this work deals with the nature of the term element (Scerri 2005; Hendry 2005; Scerri 2006; Hendry 2006). Other aspects include the manner in which quantum mechanics does or does not provide a fundamental understanding of the periodic system (Scerri 2004a; Friedrich 2004). In addition, some philosophers working in the structuralist tradition have claimed that the periodic system can be axiomatized and that this approach casts new light on the question of the reduction of chemistry to physics (Hetteema and Kuipers 1988; Scerri 1997). In the area of metaphysics of science Robin Le Poidevin has explored the reason why Mendeleev could be confident that elements in his periodic system were physical possibilities and not merely logical possibilities (Le Poidevin 2005). There has been renewed debate concerning the positioning of certain elements such as hydrogen and helium in the periodic table (Atkins and Kaesz 2003; Scerri 2004b). Taking a philosophical twist, this question has been connected with discussions on the nature of the elements and whether they should be primarily regarded as basic substances or simple substances (Scerri 2005).

A former assistant editor of this journal has recently published an edited collection of the papers of Mendeleev that includes some new translations of papers as well as some previously difficult to obtain translations of the work of the master chemist (Jensen 2005). A major biography of Mendeleev has been published and another is in preparation (Gordin

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¹ These two articles were written specifically to commemorate the centenary of Mendeleev’s death.

2004). Numerous alternative representations of the periodic system have been proposed or revived (Stewart 2004), including a book devoted to the left-step periodic table (Bent 2006).

A major international conference was held on the question of the periodic table, resulting in the publication of two volumes of collected papers (King and Rouvray 2004). Igor Dimitriev, the current director of the Mendeleev Museum in St. Petersburg, has published an in depth and revisionist account of the origins of Mendeleev's periodic table (Dimitriev 2004).

A new "knight's move relationship" has been announced by the South African chemist, Michael Laing, one of the contributors to the present issue (Laing 1999). A major book has been published and has been described as the definitive account of the history and philosophy of the periodic system (Scerri 2007). This book is reviewed in the present issue by Geoffrey Rayner Canham. The same author also contributes an article to the present issue, which is aimed at subjecting Laing's knight's move relationship to a critical analysis. Meanwhile Laing's own paper in this issue considers the thorny question of where the element hydrogen should be placed within the periodic table.

The remaining papers in the issue consist of Eugen Schwarz's exhaustive analysis of the notion of electronic configurations and the orbital approximation, including some particularly interesting special cases. Last but not least, a contribution from Colombia by Guillermo Restrepo and Leonardo Pachón approaches the periodic system from a mathematical perspective including a review of several approaches using number theory, information theory, order theory, set theory and topology.

And that's just the first part, since yet more papers concerning the periodic table will be published in the next issue of the journal.

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