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Mendeleev on the Periodic Law: Selected Writings, 1869–1905

selected and edited by William B. Jensen

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reviewed by Theodor Benfey

The periodicity of properties as atomic weights of elements increase is the chemist's central organizing principle. Yet two book series purportedly bringing chemistry's foundational publications to the English-reading public failed to include papers on the periodic law. The German series on the other hand, the Ostwald Klassiker,[1] did. The *Alembic Club Reprints,*[1] which the chemistry community had hoped would have been the English equivalent, included nothing on the periodic law. Nor did the Dover Classics of Science series of the 1960s and early 1970s in which only three chemistry titles appeared. Dover has now made partial amends by publishing Jensen's *Mendeleev on the Periodic Law: Selected Writings 1869–1905.* Here are 13 of Mendeleev's complete or partial publications (some are the relevant sections of books) that illuminate Mendeleev's developing ideas on periodicity. Of Mendeleev's numerous publications, Jensen chose those that had been translated from Russian into German, French, or English during his lifetime. Some of these are here translated from German or French into English for the first time. Where a 19th or early 20th century English translation already existed, it was compared with any previous German or French version and corrected and/or retranslated if necessary.

The book is divided into three sections, to each of which Jensen has supplied a very helpful and insightful introduction: Origins of the Periodic Law, 1869–1871; Priority Disputes and Confirmations, 1871–1886; and Acceptance and Recognition, 1887–1907. These introductions teach us much about publishing in the 19th century, national rivalries, and the carelessness of proofreaders.

I am always delighted when a major breakthrough in science occurs not through experimental research but through textbook writing, as it did with Mendeleev and Kekulé. We learn of Mendeleev's changing views of Lothar Meyer's contribution, which he first tried to dismiss but by the time he and Meyer jointly received the Davy medal of the Royal Society he fully recognized what Meyer had contributed. Five years later at the 1887 Victoria Jubilee meeting of the British Association for the Advancement of Science, Meyer even acted as Mendeleev's translator (from German to English). The early dismissal probably stemmed in part from the feeling among Russian scientists of that time that German scientists routinely underestimated what Russians could offer.

Once Mendeleev enunciated the periodic law he felt it must be absolute, without exceptions. Thus he was loath to admit that tellurium had a higher atomic weight than iodine while the discovery of helium, and then of the other noble gases, had him puzzled for a long time. One fascinating paper Jensen included was Mendeleev's admittedly speculative discussion of the luminiferous ether, its particulate nature, the likely miniscule atomic weight of its particles, and his estimate of their fabulously high velocities. What stands out throughout is Mendeleev's extraordinary breadth and depth of knowledge of the chemistry of all the elements known in his time.

Note

1. When the physical chemist and Nobel Prize winner Wilhelm Ostwald looked at the original papers of famous scientists, he invariably received new insights. So in 1889 he launched a series of booklets, *Ostwalds Klassiker der exakten Wissenschaften* (Classics of the exact Sciences); see below for more information. Ostwald was not alone. The *Alembic Club Reprints,* a series of slim booklets each containing one or a few classic papers, started to appear in 1893, published by E. & S. Livingstone in Edinburgh. Whereas the German series covered all the sciences, the 22 Alembic booklets were limited to chemistry or closely related fields. They included of course Dalton, Humphry Davy, Faraday, Avogadro, Cannizzaro, Cavendish, Pasteur, and the Scottish co-enunciator of the structural theory of organic chemistry, A. S. Couper. The series terminated in 1958, though some booklets were reprinted later.

Ostwalds Klassiker der exakten Wissenschaften was a far more ambitious undertaking. Through 1987, 275 titles had been published. The original publisher was Wilhelm Engelmann in Leipzig. After World War I the Akademische Verlagsgesellschaft took over. When the Second World War ended and Germany was split in two, two publishers for a time put out further volumes.

The *Klassiker* volume focusing on the periodic law was *Das natürliche System der chemischen Elemente: Abhandlungen von Lothar Meyer 1864–1869 und D. Mendelejeff 1869–1871*; K. Seubert was the editor; Wilhelm Engelmann, Leipzig, published this volume in 1895. It was No. 68 in the *Klassiker* series and was reprinted as a second edition in 1913.

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