Finding order in Nature.

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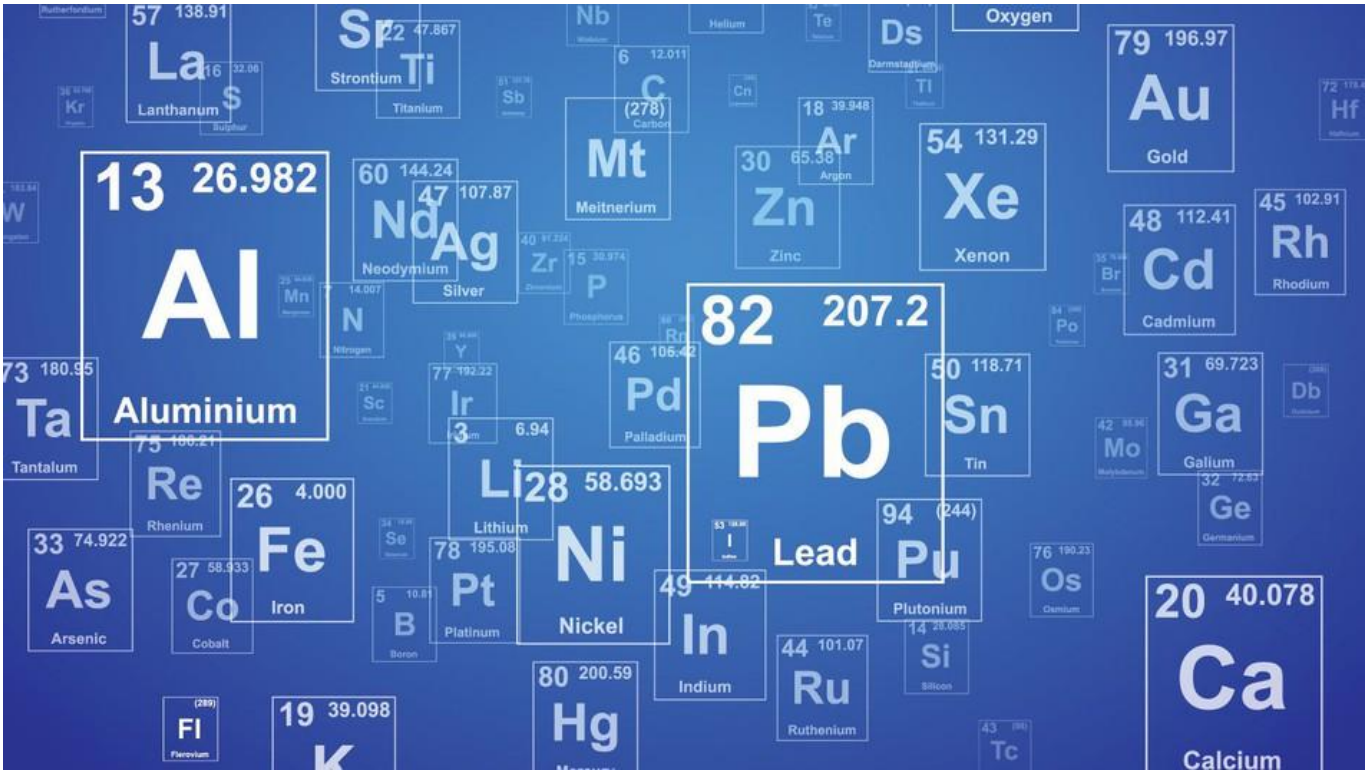
Although 2019 has been designated International Year of the Periodic Table to commemorate Mendeleyev's first table of 1869, the development of the periodic table is better regarded as a slow, evolutionary process, beginning long before 1869 and continuing for many years after Mendeleyev's death. We will examine this historical development and show how the periodic table was constructed with continual modification to allow the incorporation of new elements [1]. Interestingly, the arguments were based almost exclusively on chemical observations. Although the first quantum theory of the atom was introduced by Bohr in 1913, it was only after the establishment of the Pauli exclusion principle and the development of wave mechanics that a satisfactory description of the electronic structure of the elements was available. This allowed the *post facto* rationalization of the periodic table in terms of electronic configuration. The regular variation of electron configuration is at the origin of the regular variation of a wide variety of chemical properties. We will look at a number of examples of this since they are a vital aid to the teaching of chemistry.

[1] D.A. Johnson and A.F. Williams, *Chimia*, **2019**, *73*, 144-151.



Bildquelle: https://mashable.com/2016/01/04/new-elements-periodic-table/ *IMAGE: EYEMATRIX*