The Periodic Table (A brief History)

Boyle, an experimenter like Galileo and Bacon, and who was influenced much by Gassendi, and Descartes, lent important weight to the atomic theory of matter in the 1600s.
It was Lavoisier who divided the few elements known in the 1700's into four classes, and then John Dalton made atoms even more convincing, suggesting that the mass of an atom was it's most important property.

"The chemical elements are composed of... indivisible particles of matter, called atoms... atoms of the same element are identical in all respects, particularly weight." - Dalton

In the early 1800's Dobereiner noted that similar elements often had relative atomic masses, and DeChancourtois made a cylindrical table of elements to display the periodic reoccurrence of properties.

Cannizzaro determined atomic weights for the 60 or so elements known in the 1860s, then a table was arranged by Newlands, with the elements given a serial number in order of their atomic weights, beginning with Hydrogen.

This made evident that "the eighth element, starting from a given one, is a kind of repetition of the first", which Newlands called the Law of Octaves.

Both Meyer and Mendeleev constructed periodic tables independently, Meyer more impressed by the periodicity of physical properties, while Mendeleev was more interested in the chemical properties.

"...if all the elements be arranged in order of their atomic weights a periodic repetition of properties is obtained." - Mendeleev

Mendeleev published his periodic table & law in 1869 and forecast the properties of missing elements, and chemists began to appreciate it when the discovery of elements predicted by the table took place. Periodic table has always been related to the way scientists thought about the shape and structure of the atom, and has changed accordingly.

The `modern' periodic table is very much like a later table by Meyer, arranged, as was Mendeleev's, according to the size of the atomic weight, but with Group 0 added by Ramsay. Later, the table was

reordered by Mosley according to atomic numbers (nuclear charge) rather than by weight.

The Periodic Law revealed important analogies among the 94 naturally occurring elements, and stimulated renewed interest in Inorganic Chemistry in the nineteenth century which has carried into the present with the creation of artificially produced, short lived elements of `atom smashers' and supercollider's of high energy physics.

Harry D. Hubbard, of the United States National Bureau of Standards, modernized Mendeleevs periodic table, and his first work was published in 1924. This was known as the "Periodic Chart of the Atoms".

Into the 1930s the heaviest elements were being put up in the body of the periodic table, and Glenn Seaborg "plucked those out" while working with Fermi in Chicago, naming them the Actinide series, which later permitted proper placement of subsequently 'created' elements - the Tran actinides, changing the periodic table yet again. These elements were shown separate from the main body of the table.

When he examined the Alexander Arrangement, he said that it was correct, and later told a photographer (see photo) that it was his favourite periodic table.

The Alexander Arrangement of the Elements, a three-dimensional periodic chart designed and patented by Roy Alexander and introduced in 1994, retains the separate Lanthanide and Actinide series, but integrates them at the same time, made possible by using all three dimensions.

Further improvement provided by the Alexander Arrangement of the Elements is location of all the element data blocks in a continuous sequence according to atomic numbers while retaining all accepted property interrelationships.
This eases use & understanding of the immense correlative power of the periodic chart in teaching, learning, and working with chemistry.