substances. Matter, therefore, is composed of minute indivisible particles of the same or of different elements, and of these everything that is apparent to the senses is made up. Cut and carve down these particles as you may, in the end there is left the uncuttable particle or atom of each element.

This hypothesis of Dalton's was by no means new; indeed he merely resuscitated a theory put forward more than two thousand years previously. These early philosophers—Democritus (B.C. 460), Lucretius, the Latin poet who was born about a century before the Christian era—attempted to connect the differences of size, shape, and qualities of various forms of matter with the differences of size, shape, position, and movements of what they called the *atoms* of matter. Everything material, they held, was composed of "a coalescence of certain unchangeable and indivisible particles"; no atom of anything could either be created or destroyed; when substances ceased to exist, another was formed; no destruction of matter took place, merely a rearrangement of the atoms. The ancients were evidently as fully alive to the soundness of the doctrine of the indestructibility of matter as we are now. Their conception of its various forms coincides with the modern ideas also; a solid body consisted of a vast number of atoms squeezed closely together, a liquid of a less number more loosely connected, and a gas of a still smaller number able to move freely and distributing themselves uniformly throughout the space containing them.

The atomic theory, as enunciated by the Manchester schoolmaster (Dalton), was based on observations of the manner in which the elements combined with one another, namely in fixed and definite proportions:—the atoms of each element had a definite weight peculiar to all the atoms of that particular substance. This theory has served the purposes of chemists for the past century, and has been, and still is a convenient quantitative method of expressing chemical changes as they occur. The chemist can calculate the amounts of material necessary for the formation of new combinations—alike in the factory as in the laboratory—and can prophesy the yield he will obtain from the union of known quantities of different elements or compounds. But though the atomic theory has for so long been a perfect working hypothesis from the chemist's point of view, recent researches, depending mostly on the study of electricity and radio-activity, have led to the displacement of the atom from its position as the unit form of matter. Fac