6. Rule of fixed proportions.

before the age of Lavoisier, another general conception had been introduced into chemical research; this was the rule of definite proportions—*i.e.*, the fact that substances, whether simple or compound, combine only in definite proportions of their weight, and that the numbers marking these proportions are characteristic of every definite chemical substance. It took some time, nearly a century, before this idea, which arose through the examination of neutral salts and the determination of the quantities of acids and alkalies which were wanted to effect mutual saturation, became clear; before the rule of definite proportions was generally established, becoming a guide for chemical analysis. It is interesting to note how the vaguer terms of chemical affinity and elective attraction, of chemical action, of adhesion and elasticity—mostly borrowed from other departments of science where they had definite meanings—gradually disappeared, when by the aid of the chemical balance each simple substance and each definite compound began to be characterised, and labelled with a fixed number. Nevertheless, even at the beginning of this century, eminent chemists were still so much engaged in discussing the rival claims of the old phlogistic, and the modern theory of combustion, of Berthollet's chemical equilibrium, of the so-called dynamical and the electro-chemical views of phenomena, that the first methodical attempt actually to fix these numbers—*i.e.*, to give a table of chemical equivalents—remained unnoticed.[1]

[1] The history of chemistry early in this century furnishes a good example of the sway which theoretical views exercised over the minds of investigators. Berthollet, who began by critically examining Bergmann's doctrine of chemical affinities, was evidently much influenced by the mathematical theory of attraction, and by the mechanical laws of equilibrium, which formed so prominent a subject of investigation in the