## GRAVITATION AND ATOMIC THEORY.

numbers represent the proportions in which the different elements combine with the arbitrarily fixed quantity of the starting substance, the oxygen; they also represent the *proportions in which they unite among themselves*, or at any rate bear some exceedingly simple ratio to these proportions."

(Page 193. Combination by volume.)

"The ultimate reason of the law in question (combination by volume) is to be found in the very remarkable relation established by the hand of Nature between the specific gravity of a body in the gaseous state and its chemical equivalent; a relation of such a kind that quantities by weight of the various gases expressed by their equivalents, or in other words, quantities by weight which combine, occupy under similar circumstances of pressure and temperature either equal volumes, or volumes bearing a simple proportion to each other." "If both the specific gravity and the chemical equivalent of a gas be known, its equivalent or combining volume can be easily determined, since it will be represented by the number of times the weight of an unit of volume (the specific gravity) is contained in the weight of one chemical equivalent of the substance. In other words, the equivalent volume is found by dividing the chemical equivalent by the specific gravity."

If we consider the elementary atoms of the chemist to be the elementary particles of matter, then, it is quite evident, that these results, of very numerous carefully conducted chemical experiments, entirely disagree with the deductions from the guinea and feather experiment previously detailed; because the information furnished us by these experiments is that the weight of a body consists in the atomic weight of its elementary particles multiplied into the number of those particles; or in other words, the atomic weight of that particular description of matter of which the body consists multiplied into the quantity thereof.

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