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## SOME ASPECTS OF ELEMENTARY CHEMISTRY.

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In looking over the smaller text books of chemistry one is struck with the large amount of space devoted to the description of the elements and their compounds, and the prominence of the atomic theory in the presentation of the subject. This is usually at the expense of the fundamental laws of chemistry and of the very idea of the chemical change. Dalton was led to the chemical atomic theory by his discovery of the law of multiple proportions but nowadays chemical students for the most part discover the law of multiple proportions by means of the atomic theory! It would seem advisable to return to Dalton's way. So persistently and, it would seem, generally, is the cart put before the horse in this respect, that it seems to be a not uncommon belief among junior students that if the atomic theory is rejected the laws of combination go with it. There would be a general smash!

It will be well to examine the laws of combination from this point of view, so as to reassure ourselves. The law of Definite

Composition or Fixed Proportions is a statement of the discovery that any particular compound is always composed of the same elements in the same proportions. For example, calcium carbonate is never found to vary materially from the following composition:— Calcium, 40 per cent.; carbon, 12 per cent.; oxygen, 48 per cent. This is a deduction from innumerable analyses and is evidently as independent of the atomic or any other theory, as observations, like the rising of the sun, or the melting point of ice. Hundreds of thousands of distinct chemical compounds are known, and without exception they have this constancy of composition.\* The law of Multiple Proportions was discovered by John Dalton in 1802 by investigation of olefiant gas and marsh gas. It was obvious from the experiments which he made upon these, that the constituents of both were carbon and hydrogen, and nothing else. He found further that, if we reckon the carbon in each the same, then carburetted hydrogen gas (marsh gas) contains

\*This statement does not cover isomorphous mixtures.