ON THE RELATIVE PROPORTIONS OF THE ELEMENTARY FORMS OF BODIES.

It has been minutely ascertained, within the last twenty years, by an almost infinite variety of accurate and well-defined experiments by Higgins, Dalton, Gay, Lussac, and Davy, that the combination and separations of all simple bodies are conducted in a definite and invariable ratio of relative weight or measure; as that of one part to one part, one part to two parts, one to three, one to four; and, consequently, that every change in the compound thus produced, whether of addition or diminution, is a precise multiple or division of such ratio; or, in other words, that the different elementary bodies which enter into such compounds can never unite or separate, never lay hold of or let go each other, in any other proportions.

Let us exemplify this remark by a familiar instance or two. It is now well known to every one that the calxes, oxides, or, as they are often called, rusts, of metals, consist of a certain portion of oxygen with a certain portion of the metal, which is thus converted into a calx or oxide. It is also known in the present day to most persons, that the greater number of metals are possessed of two or more kinds of oxides, produced by a union of different proportions of the oxygen and the metal, and often distinguishable even by their colour; as minium, or red lead, and ceruse, or white lead, which are equally oxides of the metal whose name they bear. Now, in whatever proportion the oxygen unites with the metal to produce an oxide of one kind, it invariably unites by a multiple or divisor of the same proportion to produce every kind of oxide belonging to the same metal. Thus we have discovered not less than four different oxides of antimony in different parts of the world: the lowest or simplest of them, contains four and a half parts of oxygen to one hundred parts of metal; the next simplest contains eighteen parts of oxygen to one hundred parts of metal, which is four times four and a half; the third oxide consists of twenty-seven parts of oxygen to one hundred parts of metal, which is six times four and a half; and the fourth oxide, thirty-six parts of oxygen to the one hundred parts of metal, which is eight times four and a half. So, tin, which possesses three discovered oxides, has for its lowest the proportion of seven parts of oxygen to one hundred parts of metal; for its second oxide, fourteen parts of oxygen to one hundred parts of metal, which is twice seven; and, for its highest, twenty-one parts of oxygen to one hundred parts of metal, which is three times seven. I have given the proportions in round numbers, but if I were to use the fractions that belong to them, the comparative results would be precisely the same. Now can we possibly combine these substances in any other proportions so as to produce oxides; for the corpuscles of which they consist will not lay hold of or let go each other in any other ratios. And it is not the least important part of this discovery, that not only in the union or separation of simple substances, but in all well known and more complicated compounds, so far as the experimental series has been carried, the elementary bodies which enter into them exhibit proportions equally definite and invariable; thus affording another proof of close connexion between the phenomena of nature and the occasional developement of revelation; the philosopher beholding now, as the prophet beheld formerly, that the Almighty Architect has literally adjusted every thing by weight and measure; that he has measured the waters and meted out the heavens, accurately comprehended the dust of the earth, weighed the mountains in scales, and the hills in a balance.—*Good's Book of Nature.*