

law, affords the means of determining at once the exact proportion of the ingredients of all natural compounds, if we only know the place they hold in the system. In chemistry, the number of admitted elements is between fifty and sixty, and new ones are added continually as the science advances. Now, the moment the number corresponding to any new substance added to the list is determined, we have, in fact, ascertained all the proportions in which it can enter into combination with all the others, so that a careful experiment made with the object of determining this number is, in fact, equivalent to as many different experiments as there are binary, ternary, or yet more complicated combinations capable of existing, into which the new substance may enter, as an ingredient.

(223.) The importance of obtaining exact physical data can scarcely be too much insisted on, for without them the most elaborate theories are little better than mere inapplicable forms of words. It would be of little consequence to be informed, abstractedly, that the sun and planets attract each other, with forces proportional to their masses, and inversely as the squares of their distances: but, as soon as we know the data of our system, as soon as we have an accurate statement (no matter how obtained) of the distances, masses, and actual motions of the several bodies which compose it, we need no more to enable us to predict all the movements of its several parts, and the changes that will happen in it for thousands of years to come; and even to extend our views backwards into time, and recover from the past, phenomena, which no observation has noted, and no history recorded, and which yet (it is possible) may have left indelible traces of their existence in their influence on the state of nature in our own globe, and those of the other planets.

(224.) The proof, too, that our data *are* correctly assumed, is involved in the general verification of the whole theory, of which, when once assumed, they form a part; and the same comparison with observation which enables us to decide on the truth of the abstract