

proportion (or one of them, if there be more than one proportion possible), in which, according to the law in question, sulphur and lead can combine; now, this can never be decided by merely looking at the law in all its generality. It is clear, that, when particularized by restricting its expression to sulphur and lead, the law should state *what are* those particular fixed proportions in which these bodies can combine. That is to say, there must be certain data or numbers, by which these are distinguished from all other bodies in nature, and which require to be known before we can apply the general law to the particular case. To determine such data, observation must be consulted; and if we were to have recourse to that of the combination of the two substances in question with each other, no doubt there would be ground for the logical objection of a vicious circle: but this is not done; the determination of these numerical data is derived from experiments purposely made on a great variety of different combinations, among which that under consideration does not of necessity occur, and all these being found, independently of each other, to agree in giving the same results, they are therefore safely assumed as part of the system. Thus the law of definite proportions, when applied to the actual state of nature, requires two separate statements, the one announcing the general law of combination, the other particularizing the numbers appropriate to the several elements of which natural bodies consist, or the data of nature. Among these data, if arranged in a list, there will be found opposite to the element sulphur the number 16, and opposite to lead, 104;* and since 20 is to 130 in the exact proportion of 16 to 104, it appears that the combination in question affords a satisfactory verification of the law.

(222.) The great importance of physical data of this description, and the advantage of having them well determined, will be obvious, if we consider, that a list of them, when taken in combination with the general

* Thomson's First Principles of Chemistry.