

which is naturally associated with the elements of the grain of water, endowing them with their mutual affinity.

Many of the subordinate facts and laws which were brought to light by these researches, clearly point to generalizations, not included in that which we have had to consider, and not yet discovered: such laws do not properly belong to our main plan, which is to make our way *up to* the generalizations. But there is one which so evidently promises to have an important bearing on future chemical theories, that I will briefly mention it. The class of bodies which are capable of electrical decomposition is limited by a very remarkable law: they are such binary compounds only as consist of *single* proportionals of their elementary principles. It does not belong to us here to speculate on the possible import of this curious law; which, if not fully established, Faraday has rendered, at least, highly probable:⁴² but it is impossible not to see how closely it connects the Atomic with the Electro-chemical Theory; and in the connexion of these two great members of Chemistry, is involved the prospect of its reaching wider generalizations, and principles more profound than we have yet caught sight of.

As another example of this connexion, I will, finally, notice that Faraday has employed his discoveries in order to decide, in some doubtful cases, what is the true chemical equivalent;⁴³ "I have such conviction," he says, "that the power which governs electro-decomposition and ordinary chemical attractions is the same; and such confidence in the overruling influence of those natural laws which render the former definite, as to feel no hesitation in believing that the latter must submit to them too. Such being the case, I can have no doubt that, assuming hydrogen as 1, and dismissing small fractions for the simplicity of expression, the equivalent number or atomic weight of oxygen is 8, of chlorine 36, of bromine 78·4, of lead 103·5, of tin 59, &c.; notwithstanding that a very high authority doubles several of these numbers."

Sect. 4.—Reception of the Electro-chemical Theory.

THE epoch of establishment of the electro-chemical theory, like other great scientific epochs, must have its sequel, the period of its reception and confirmation, application and extension. In that period we

⁴² Art. 697.

⁴³ 851.