a conjecture by Davy, and adopted as the basis of chemistry by Berzelius, could only be established by exact measures and rigorous proofs. Faraday had, in his proof of the identity of voltaic and electric agency, attempted also to devise such a measure as should give him a comparison of their quantity; and in this way he proved that[19] a voltaic group of two small wires of platinum and zinc, placed near each other, and immersed in dilute acid for three seconds, yields as much electricity as the electrical battery, charged by ten turns of a large machine; and this was established both by its momentary electro-magnetic effect, and by the amount of its chemical action.[20]

It was in his "Seventh Series," that he finally established a principle of definite measurement of the amount of electrolytical action, and described an instrument which he termed[21] a *volta-electrometer*. In this instrument the amount of action was measured by the quantity of water decomposed: and it was necessary, in order to give validity to the mensuration, to show (as Faraday did show) that neither the size of the electrodes, nor the intensity of the current, nor the strength of the acid solution which acted on the plates of the pile, disturbed the accuracy of this measure. He proved, by experiments upon a great variety of substances, of the most different kinds, that the electro-chemical action is definite in amount according to the measurement of the new instrument.[22] He had already, at an earlier period,[23] asserted, that *the chemical power of a current of electricity is in direct proportion to the absolute quantity of electricity which passes*; but the volta-electrometer enabled him to fix with more precision the meaning of this general proposition, as well as to place it beyond doubt.

The vast importance of this step in chemistry soon came into view. By the use of the volta-electrometer, Faraday obtained, for each elementary substance, a number which represented the relative amount of its decomposition, and which might properly[24] be called its "electro-chemical equivalent." And the question naturally occurs, whether these numbers bore any relation to any previously established chemical measures. The answer is remarkable. *They were no other than the atomic weights of the Daltonian theory*, which formed the climax of the previous ascent of chemistry; and thus here, as everywhere in

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[19] *Researches*, Art. 371. [20] 537. [21] 739.
[22] Arts. 758, 814. [23] 877. [24] 792.