

with a distinctness which Beccher did not attain. In 1697, appeared Stahl's *Zymotechnia Fundamentalis* (the Doctrine of Fermentation), "simulque *experimentum novum* sulphur verum arte producendi." In this work (besides other tenets which the author considered as very important), the opinion published by Beccher was now maintained in a very distinct form;—namely, that the process of forming sulphur from sulphuric acid, and of restoring the metals from their calces, are analogous, and consist alike in the addition of some combustible element, which Stahl termed *phlogiston* (φλογίστον, *combustible*). The experiment most insisted on in the work now spoken of,<sup>2</sup> was the formation of sulphur from sulphate of potass (or of soda) by fusing the salt with an alkali, and throwing in coals to supply phlogiston. This is the "experimentum novum." Though Stahl published an account of this process, he seems to have regretted his openness. "He denies not," he says, "that he should peradventure have dissembled this experiment as the true foundation of the Beccherian assertion concerning the nature of sulphur, if he had not been provoked by the pretending arrogance of some of his contemporaries."

From this time, Stahl's confidence in his theory may be traced becoming more and more settled in his succeeding publications. It is hardly necessary to observe here, that the explanations which his theory gives are easily transformed into those which the more recent theory supplies. According to modern views, the addition of oxygen takes place in the formation of acids and of calces, and in combustion, instead of the subtraction of phlogiston. The coal which Stahl supposed to supply the combustible in his experiment, does in fact absorb the liberated oxygen. In like manner, when an acid corrodes a metal, and, according to existing theory, combines with and oxidates it, Stahl supposed that the phlogiston separated from the metal and combined with the acid. That the explanations of the phlogistic theory are so generally capable of being translated into the oxygen theory, merely by inverting the supposed transfer of the combustible element, shows us how important a step towards the modern doctrines the phlogistic theory really was.

The question, whether these processes were in fact addition or subtraction, was decided by the balance, and belongs to a succeeding period of the science. But we may observe, that both Beccher and Stahl were aware of the increase of weight which metals undergo in calcina-

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<sup>2</sup> P. 117.