For many years before this period, Mr Watt tells us he had entertained an opinion, that air was a modification of water, which was originally founded on the facts, that in most cases wherein air was actually made (which ſhould be distinguiſhed from thoſe wherein it is only extricated from ſubstances containing it in their pores, or otherwiſe united to them in the state of air), the ſubstances were ſuch as were known to contain water as one of their constituent parts ; yet no water was obtained in the processes, except what was known only to be loosely connected with them, such as the water of tire crystallization of salts. This opi­nion arose from a diſcovery, that the latent heat contained in steam diminiſhed in proportion as the sensible heat of the water from which it was produced increaſed. In other words, the denſer the steam was, the leſs latent heat it contained.

Having been informed by Dr Priestley of the reſult of the experiment of firing a mixture of dephlogisticated and inflammable air, Mr Watt was enabled to form the very theory which has been since demonstrated to be true. “ Let us consider (says he) what obviously happens in the case of the deflagration of the inflammable and dephlogisticated air. Theſe two kinds of air unite with violence, they become red hot, and upon cooling totally diſappear. When the vessel is cooled, a quantity of water is found in it equal to the weight of the air employed. The water is then the only remaining product of the proceſs ; and water, light, and heat, are all the products, unleſs there be ſome other matter ſet free which eſcapes our ſenſes. Are we not then authorised to conclude, that water is compoſed of dephlogisticated air and phlogiston deprived of part of their latent or elementary heat; that dephlogisticated or pure air is compoſed of water deprived of its phlogiston and united to elementary heat and light; and that the latter are contained in it in a latent state, ſo as not to be ſensible to the thermo­meter or to the eye ; and if light be only a modification of heat, or a circumstance attending it, or a component part of the inflammable air, then pure or dephlogisticated air is compoſed of water deprived of its phlogiston and united to elementary heat ?”

We have ſaid that the theory of Mr Watt is new demonstrated to be true. To this aſſertion an objection may be raised from the language in which he states his theory ; for he explains it by using the word *phlogiston)* a word which is now exploded from philoſophy as the name of an imaginary substance. But it is ſufficient to reply, that Mr Watt uſes the word phlogiston as ſynonymous with inflammable air. It may be proper alſo to add, that the passage quoted above was contained in a letter from Mr Watt to Dr Priestley, dated the 26th of April 1783.

Most of the experiments hitherto made favoured the conclusion which Mr Watt had drawn ; but ſo many difficulties occurred to Mr Cavendish and Dr Priestley, that they ſeemed to hesitate about the theory. Dr Priestley in particular, after consideration, declared against it ; while Mr Cavendiſh only waited till the difficulties ſhould be removed. In the mean time experiments were made in a different quarter, which gave the most incontestable proofs of the truth of the theory.

**M.** de Luc had gone to Paris in January 1783. During his residence there, he received a letter from Dr Priestley, announcing the reſult of his experiments concerning the conversion of water into air. Μ. de Lue immediately commu­nicated the contente of this letter to ſeveral members of the **Academy** of Sciences. But the difficulties which had oc­curred to Dr Priestley prevented them from acquieſcing in **Mr Watt’s** theory. In the month of June following, **Dr Blagden,** who **was** well acquainted with all the experiments both of Mr Cavendish and of Dr Priestley, and of the opinions of Mr Watt, made a journey to Paris, in which he had an opportunity of conversing on this subject with the same gentlemen of the Academy to whom Μ. de Luc had formerly imparted the experiments of Dr Priestley. Notwithstanding the additional facts which he was enabled **to** lay before them, he found them averſe from admitting the theory. They ſuppoſed that the water collected after the combustion of the two kinds of air had been dissolved in them before. As the question depended upon the proof of **a** fact, they reſolved however to make the proper experiments for examining it. The celebrated Lavoisier took this experiment upon himſelf. It was made on the 24th of June in the preſence of Dr Blagden and many gentlemen of the academy; and the ſucceſs was as complete as the most ſanguine imagination could have conceived. It was repeat­ed by Meſſrs Monge and Meunier, and the same reſult was found. The composition of water was now therefore put beyond doubt, and is now almost univerſally received as an unquestionable fact.

As we wiſh upon all occasions to aſcribe to all eminent men the honour which they deserve, we ſhould willingly eſtimate the comparative merit of thoſe philoſophers who were most active in this diſcovery ; but though we feel ourſelves diſpoſed to be altogether impartial, it is attended with ſo many difficulties, that we will not preſume to affirm that our opinions are formed with perfect accuracy. With reſpect to Mr Watt, we think it appears that he was the first person who formed the true theory. He had for many years before thought it probable, that if the latent heat of steam could be wholly converted into ſensible heat by a great increaſe of heat, the steam might ſuffer ſome remarkable change, ſuch as into permanent air. And no ſooner had he heard of the deflagration of oxygenous and hydrogenousgas by Dr Priestley, than he formed this theory.

Mr Cavendiſh had the merit of making a proper uſe of Dr Priestley’s account of Mr Warltire’s experiment, from which Dr Priestley had been able to draw no conclusions, but had considered it merely as a curious fact. Without knowing any thing of Mr Watt’s ideas, as far as appears **to** us, he made a number of ingenious experiments, which led him to conclude, that it was highly probable that water was a composition of air. The air which he employed ſeems not to have been pure ; ſo that besides the water he procu­red a quantity of nitrous acid. He however acted like an able and candid philoſopher ; he went as far as his experiments would permit him, and he went no farther. In one point he continued to differ from Mr Watt after his theory was made public. Mr Watt ſuppoſed that water consisted of dephlogisticated air (oxygenous gas) and phlogiston (hy­drogenous gas according to him), deprived of part of their latent heat ; whereas Mr Cavendiſh thought there was **no** ſuch thing as elementary heat. We must further add, that it was Mr Cavendiſh who taught Dr Priestley to turn to **a** proper account the experiment of Mr Warltire ; and there­fore, that it was in fact from Mr Cavendiſh’s experi­ments ultimately that Mr Watt was enabled to establish his theory.

The merit of Dr Priestley lies wholly in his being the in­strument of promoting this discovery. He first publiſhed the experiment of Mr Warltire ; and when Mr Cavenciſh had informed him of the ſucceſs he had met with in repeat­ing that experiment, he began alſo to study the same ſubject. His diſcoveries were more uſeful to Mr Watt than to the author himſelf ; for Mr Watt formed the theory which he had formerly been meditating ; but Dr Priestley never came to a steady conclusion on the subject. We have read over carefully all his papers concerning the conversion of