

Thomas Henry (1734-1816)

**PREFACE TO LAVOISIER,  
*ESSAYS PHYSICAL & CHEMICAL*  
(1776)**

It has been observed by one of the greatest Philosophers of the present age, that “if those who unhappily I spent their time and substance in search after an imaginary production that was to reduce all things to gold, had, instead of that fruitless pursuit, bestowed their labour in searching after that much neglected volatile *Hermes*, who has so often escaped through their burst receivers in the disguise of a subtle spirit, a mere flatulent explosive matter ; they would then, instead of reaping vanity, have found their researches rewarded with very considerable discoveries (Hale’s Statics, Vol. I. p. 316).

It will appear that this observation has been strongly verified. Since men have ceased to pay attention to the arrogant pretensions and idle dreams of the old Alchemists, and have directed their inquiries on physical principles, a very rapid progress has been made in the improvement of Chemistry. Mystery and empyricism have given place to systematical perspicuity ; men of the first character in Philosophy, and of the highest rank and opulence, have become cultivators of the science, and Chemistry, instead of confining her pursuits to the transmutation of metals or the discovery of panaceas, has now taken a more liberal and enlarged field of action, and has greatly contributed, and, it is hoped, from the progress which the every day makes will still more extensively contribute to the improvement of the other arts and sciences. By her assistance philosophers have been enabled to make greater discoveries in a few years, than they were before capable of effecting in an age. Instead of building on the sandy foundation of hypothesis, they now establish more durable systems supported by experiment and rational induction. These are the trials to which every new opinion is to be submitted; and, however plausible its appearance or respectable its inventor, no theory can be admitted which will not stand the test of this examination.

The advantages arising from the aid which Chemistry affords to the other branches of Physics, have been in nothing more conspicuous than in the very important discoveries which have been lately made relative to the nature and contribution of Air .

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By the assiduous application and unremitting attention of several eminent Philosophers, and particularly among our own countrymen of Messieurs Hales, Black, Macbride, Cavendish and Priestley, a number of experiments have been made, by which the analysis of this fluid has been pursued much farther than could possibly have been expected; and hence many new and curious discoveries have resulted, which were wholly unforeseen even by the ingenious experimentalists themselves.

Besides the most convincing demonstration of the existence of air, in a fixed state, in several of the hardest and most solid bodies, capable notwithstanding of recovering its elasticity whenever it is let loose from its basis by the action of fire, or by fermentation or effervescence; besides the proof that it is contained in great abundance in calcareous earths and alkaline salts, and that as on its presence depend some of their distinguishing properties, so they acquire new ones by being deprived of it; that this air has various degrees of affinity with different bodies and is capable of being transferred from one substance to another; it has also been discovered that fixed air, when restored to a state of expansibility is different from common air, fatal to animals who breathe it, yet strongly antiseptic, not only resisting the putrefaction of animal substances, but even restoring them to sweetness and firmness when actually putrid, and that, contrary to common air, it may be absorbed in considerable quantity by water.

These last properties of fixed air suggested the idea of its utility as a medicine in putrid diseases ; the trials that have been made have fully justified the expectations that had been formed of its efficacy. We are arrived at the power of imitating the acidulous and chalybeate waters in great perfection, and fixed air has been administered in various forms, and with considerable success in several diseases.

However firmly the doctrine of fixed air might appear to be established in Great Britain, some formidable opponents to it arose in Germany. These Philosophers, instead of fixed air, substituted another agent which they denominated *Acidum pingue*, with this difference that as the causticity of alkalis and quick lime, and the solubility of the latter in water, depend, according to Dr. Black's system, on their being *deprived* of fixed air, the

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German theory represents these properties as depending on those bodies providing the *acidum pingue*, which neutralizes them, and thereby gives solubility to the one, and causticity to both.

The decision of this controversy, of such importance to science, has been undertaken by M. Lavoisier of Paris, a Gentleman of distinguished rank, and an Intendant of the Finances, who, amidst the various public avocations to which the nature of his office subjects him, pursues a number of philosophical and chemical researches with almost unequalled abilities and perseverance. The history which he has given us of the gradual discoveries which have been made, relative to the subject of elastic vapours is so entertaining and instructive and his experiments so well conducted, his inferences, in general so justly, so judiciously deduced, that I thought I could not render a greater service to the public, than by translating M. Lavoisier's Treatise into English, being sensible that the reading of foreign books of science in their original language, is, from various causes, confined to a very narrow circle.

Many of my readers will perhaps be convinced that this remark is not ill founded, when they see how much has been done abroad on the subject of fixed air. I am apt to think that the modern foreign authors of whose works M. Lavoisier has given a detail, are far from being generally known in this island ; yet they seem to be distinguished by an ingenuity, and a degree of physical knowledge well deserving of our candid attention.

M. Lavoisier, in his account of the discoveries of our great English Philosopher, has, as I imagine from an insufficient acquaintance with our language, sometimes misrepresented that Author's meaning. Where this was the case, I have either altered the text by restoring Dr. Priestley's own words, or where that could not be so conveniently done, have pointed out and corrected the mistakes by notes. I have likewise, as M. Lavoisier's history only recounts Dr. Priestley's experiments as published in the Philosophical Transactions, with a view to make the historical part more complete, added a short account of his more recent discoveries contained in the first volume of his Experiments and Observations on different kinds of Air. In order to distinguish these notes from those of M. Lavoisier, I have marked them with the initial letters of my name.

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I should have been apprehensive, from my very short acquaintance with the French language, of publishing this Translation, had not my friend Mr. Aikin of Warrington kindly undertaken to revise the sheets. His perfect knowledge of the language and of the subject have certainly contributed to make it more free from error, than I fear it would otherwise have been.

A memoir of M. Lavoisier's, read before the Royal Academy of Sciences, *on the nature of the principle which combines with metals during their calcination and increases their weight*, has been, lately, put into my hands. and I thought it proper to add this by way of Appendix; and the publication of Dr. Priestley's second volume on the subject of Air, has enabled me, with that Gentleman's approbation, not only to give his sentiments on the nature of that principle, but also his ideas of the constitution of common air . But so much interesting information, such important discoveries abound in that work, that nothing but a perusal of the whole can satisfy any person possessed of the least philosophical taste.