

and colouring which is due to its origin in our sensations; and it was not clearly seen that the very same attributes which made the word so expressive in common conversation and the descriptive sciences were just those misleading features which had to be got rid of or eliminated before the term could become useful in the exact and logically progressive sciences. It was not seen that the mathematical definition of force makes the term inapplicable and useless except in cases where visible and tangible matter and motion in space are clearly distinguishable. In fact, the mathematically calculable forces of nature meant nothing else than the motions of something in space, and where neither motion nor location in space exist at all, as in mental phenomena, or where they are only incompletely defined, as in many biological processes, the whole mathematical theory of forces is inapplicable. In the early stages of the materialistic controversy the word force governed popular philosophy through a misunderstanding: it appeared, as it were, under false colours.

This false position which the notion of force retained in popular estimation was strengthened by a further conception which had been introduced into the mechanical sciences about the time when Lagrange put the Newtonian laws of motion into a final mathematical expression: this was the atomic hypothesis upon which modern chemistry was founded, and which was taken for granted by the whole school of naturalists on the Continent. This hypothesis permitted or even forced the natural philosopher to look upon all those hidden processes, which neither the naked nor the fortified