

them. However, we are to recollect that the analysis of phenomena, philosophically speaking, is principally useful, as it enables us to recognise, and mark for special investigation, those which appear to us simple; to set methodically about determining their laws, and thus to facilitate the work of raising up general axioms, or forms of words, which shall include the whole of them; which shall, as it were, transplant them out of the external into the intellectual world, render them creatures of pure thought, and enable us to reason them out *à priori*. And what renders the power of doing this so eminently desirable is, that, in thus reasoning back from generals to particulars, the propositions at which we arrive apply to an immense multitude of combinations and cases, which were never individually contemplated in the mental process by which our axioms were first discovered; and that, consequently, when our reasonings are pushed to the utmost limit of particularity, their results appear in the form of *individual facts*, of which we might have had no knowledge from immediate experience; and thus we are not only furnished with the explanation of all known facts, but with the actual discovery of such as were before unknown. A remarkable example of this has already been mentioned in Fresnel's *à priori* discovery of the extraordinary refraction of both rays in a doubly refracting medium. To give another example:—The law of gravitation is a physical axiom of a very high and universal kind, and has been raised by a succession of inductions and abstractions drawn from the observation of numerous facts and subordinate laws in the planetary system. When this law is taken for granted, and laid down as a basis of reasoning, and applied to the actual condition of our own planet, one of the consequences to which it leads is, that the earth, instead of being an exact sphere, must be compressed or flattened in the direction of its polar diameter, the one diameter being about thirty miles shorter than the other; and this conclusion, deduced at first by mere reasoning, has been since found to be true in fact. All astronomical predictions are examples of the same thing.