seem to have made even an approach to a closer analysis of it by any such scrutiny.

(203.) On the other hand, the mechanism of the great system of which our planet forms a part, escapes immediate observation by the immensity of its scale, nay, even by the slowness of its evolutions. The motion of the minute hand of a watch can hardly be perceived without the closest attention, and that of the hour hand not at all. But what are these, in respect of the impression of slowness they produce in our minds, compared with a revolving movement which takes a whole year, or twelve, thirty, or eighty years to complete, as is the case with the planets in their revolutions round the sun. Yet, no sooner do we come to reflect on the linear dimensions of these orbs (which, however, we do not *see*, nor can we measure them but by a long, circuitous, and difficult process), than we are lost in astonishment at the swiftness of the very motions which before seemed so slow.* The motion of the sails of a windmill offers (on a small scale) an illustrative case. At a distance, the rotation seems slow and steady; but when we stand close to one of the sails in its sweep, we are surprised at the swiftness with which it rushes by us.

(204.) Again, the agents employed by nature to act on material structures are invisible, and only to be traced by the effects they produce. Heat dilates matter with an irresistible force; but what heat *is*, remains yet a problem. A current of electricity passing along a wire moves a magnetized needle at a distance; but except from this effect we perceive no difference between the condition of the wire when it conveys and when it does not convey the stream: and we apply the terms current, or stream, to the electricity only, because in some of its relations it reminds us of something we have observed in a stream of air or water. In like manner

* "When we are told that Saturn moves in his orbit more than 22,000 miles an hour, we fancy the motion to be swift; but when we find that he is more than three hours moving his own diameter, we must then think it, as it really is, slow."—Thirty Letters on various Subjects, by William Jackson, 1795.