

new, being a demonstrated fact ; and the influence of such a change on the climates of particular regions, if not of the whole globe, being a perfectly fair conclusion from what we know of continental, insular, and oceanic climates by actual observation. Here, then, we have, at least, a cause on which a philosopher may consent to reason ; though, whether the changes actually going on are such as to warrant the whole extent of the conclusion, or are even taking place in the right direction, may be considered as undecided till the matter has been more thoroughly examined.

(140.) To this we may add another, which has likewise the essential characters of a *vera causa*, in the astronomical *fact* of the actual slow diminution of the eccentricity of the earth's orbit round the sun ; and which, as a general one, affecting the *mean temperature of the whole globe*, and as one of which the effect is both inevitable, and susceptible, to a certain degree, of exact estimation, deserves consideration. It is evident that the *mean* temperature of the whole surface of the globe, in so far as it is maintained by the action of the sun at a higher degree than it would have were the sun extinguished, must depend on the mean quantity of the sun's rays which it receives, or, which comes to the same thing, on the *total* quantity received in a given invariable time : and the length of the year being unchangeable in all the fluctuations of the planetary system, it follows, that the total *annual* amount of solar radiation will determine, *ceteris paribus*, the general climate of the earth. Now, it is not difficult to show that this amount is inversely proportional to the minor axis of the ellipse described by the earth about the sun, regarded as slowly variable ; and that, therefore, the major axis remaining, as we know it to be, constant, and the orbit being actually in a state of approach to a circle, and, consequently, the minor axis being on the *increase*, the mean annual amount of solar radiation received by the whole earth must be actually on the *decrease*. We have here, therefore, an evident real cause, of sufficient universality, and acting *in the right*