

things there would take place periodically, so to speak, a winding up from a lower to a higher state of potential energy, to be subsequently exchanged for newly-created *vis viva*. But as we can have no such *à priori* assurance, can only assume such restoration to be possible, and can see no means of effecting it, if possible, otherwise than by foresight and prearrangement; the one equally with the other is an unknown function, variable within unknown limits, and susceptible of fluctuations to an unknown extent, nor can we have any, the smallest, right to assert that what is expended in the one form *is*, necessarily, laid up in reserve for further use in the other. It would be very difficult, I apprehend, to show whether in the winding up of a clock, or the building of a pyramid, taking into consideration all the various modes in which *vis viva* disappears and reappears in the expenditure of muscular power, the evolution of animal heat, the consumption of the materials of our tissues (laying aside all question as to the evolution of force from intellectual effort), the propagation of vibratory motion, and a thousand other modes of transfer; the total *vis viva* of this our planet is increased or diminished. That it should remain absolutely unchanged during the process is in the last degree inconceivable. The amount of *vis viva* latent in the form of heat or molecular motion in the sun and planets in our immediate system may bear, and probably does bear, a by no means inappreciable ratio to that more distinctly patent in the form of bodily motion in the periodical circulation of the planets round the sun, and the sun and planets round