

ear could appreciate vibrations of this degree of frequency, the sensation corresponding to the middle ray of the spectrum would be that of a note about forty-two octaves above the middle C of a pianoforte.

(98.) In each of these inconceivably minute intervals of time (compared to which a single second is a sort of eternity), *a process has been gone through by every molecule of the ether concerned in the propagation of the ray*: a process as strictly definite, as exactly regulated, as the movement of a drop of the ocean in its conveyance of the tide-wave. Taking up its motion from the particle immediately behind it (whose movement it exactly imitates), and transmitting it on to that immediately before, it starts from rest, not suddenly, with a jerk, but (under the strict control of those elastic forces already mentioned), increasing gradually in speed to a maximum—then, as gradually, relaxing, coming to a momentary rest, and retreating to its original position by the same series of measured gradations in reverse order, to be ready in its place for the reception of the next impulse. Nor does it seem possible to avoid the conclusion, if we trace up the movement to its commencement—to the source of the light—the *material particle* in whose combustion or incandescence it originates—that such is the actual vibratory movement of that particle itself. And thus we are brought into the presence of the working of that mechanism by which flame and incandescence (“*φλογωπον σημα πυρος*—the brilliant *miracle* of fire,” as the Greek poet* not inaptly terms it) are pro-

* *Æschylus*.