

18. The Fluidity, Density, and Elasticity of the Air, by means of which its vibrations produce Sound.

19. The Fluidity, Density, and Elasticity of the Ether, by means of which its vibrations produce Light.

2. These are the *data*, the *elements*, as astronomers call the quantities which determine a planet's orbit, on which the mere *inorganic* part of the universe is constructed. To these, the constitution of the organic world is adapted in innumerable points, by laws of which we can trace the results, though we cannot analyze their machinery. Thus, the vital functions of vegetables have periods which correspond to the length of the year, and of the day; their vital powers have forces which correspond to the force of gravity; the sentient faculties of man are such that the vibrations of air (within certain limits,) are perceived as sound, those of ether, as light. And while we are enumerating these correspondencies, we perceive that there are thousands of others, and that we can only select a very small number of those where the relation happens to be most clearly made out or most easily explained.

Now, in the list of the mathematical *elements* of the universe which has just been given, why have we such laws and such quantities as there occur, and no other? For the most part, the data there enumerated are independent of each other, and might be altered separately, so far as the mechanical conditions of the case are concerned. Some of these data probably depend on each other. Thus the latent heat of aqueous vapour is perhaps connected with the difference of the rate of expansion of water and of steam. But all natural philosophers will, probably, agree, that there must be, in this list, a great number of things entirely without any mutual dependence, as the year and the day, the expansion of air and the