

*the inertia of its molecules*, to give rise to an equally rapid transmission of a wave through it. For it results from the theory of sound that in media of different elasticities (so understood), but similarly constituted in other respects, these forces are to each other as *the squares* of the velocities with which the waves travel: so that the elastic force of the air would require to be increased in the proportion of the square of 901,000 (*i.e.*, 811,801 millions) to 1, to produce an equal velocity. Even this enormous number must be still further increased, since the velocity of sound is augmented by a peculiarity in the constitution of air which we should hardly be justified in attributing to the luminiferous ether, in virtue of which its elasticity is increased by heat given out in the act of its compression, and without which the velocity of sound would be only 916 feet per second instead of 1090. Thus the number above arrived at has to be further increased in the proportion of the square of 1090 to that of 916, which brings it to 1,148,000,000,000. Let us suppose now that an amount of our ethereal medium equal *in quantity of matter* to that which is contained in a cubic inch of air (which *weighs* about one-third of a grain) were enclosed in a cube of an inch in the side. *The bursting power* of air so enclosed we know to be 15 lbs. on each side of the cube. That of the imprisoned ether then would be 15 times the above immense number (or upwards of 17 billions) of pounds. Do what we will—adopt what hypotheses we please—there is no escape, in dealing with the phænomena of light, from these gigantic numbers; or from the conception of *enor-*