

vessels, nerves, muscles, circulating fluids, &c., like larger animals. What, then, must be the almost infinite littleness of a particle of these fluids! Yet chemical solution carries this division of matter probably still farther. Thus it has been demonstrated that an atom of lead must weigh less than the one three hundred and ten thousand millionth part of a grain, and an atom of sulphur less than the one two trillionth part of a grain. The bulk of the atom of lead must be less than the eight hundred and eighty-eight trillionth part of a cubic inch. But it seems almost useless to make such statements; for who can form any correct idea of things so inconceivably minute? \*

If, however, we regard light as a material substance, results still more astonishing follow. It can be shown that, in such a case, the particles of light cannot weigh more than one million millionth part of a grain; for if larger, they would destroy the organs of vision.† On the same principle, it has been calculated that the particles of light that flow from a candle in a second are more than six billion times as many as the grains of sand in the whole earth, if each cubic inch contains one million.‡ The opinion that light is material, however, has given place to what is called *the undulatory theory*. This supposes the universe to be filled with a very subtle elastic fluid, called the luminiferous ether, and that the vibrations of this ether communicate the impression of light to the eye just as the vibrations of the air convey to the ear the idea of sound. But, upon this hypothesis, the inferences are no less wonderful than upon the supposition that light is material. It is a demonstrated fact, for instance, that light moves at the rate of nearly 200,000 miles (192,500) per

\* Prout's Bridgewater Treatise, p. 36.

† Turner's Sacred History, Vol. I. p. 24.

‡ Ferguson's Lectures, Vol. I. p. 228.