

On looking back at our view of this science, it will be seen that it may be distinguished into two parts; the Doctrines of Conduction and Radiation, which we call Thermotics proper; and the Doctrines respecting the relation of Heat, Airs, and Moisture, which we have termed Atmology. These two subjects differ in their bearing on our hypothetical views.

*Thermotical Theories.*—The phenomena of radiant heat, like those of radiant light, obviously admit of general explanation in two different ways;—by the emission of material particles, or by the propagation of undulations. Both these opinions have found supporters. Probably most persons, in adopting Prevost's theory of exchanges, conceive the radiation of heat to be the radiation of matter. The undulation hypothesis, on the other hand, appears to be suggested by the production of heat by friction, and was accordingly maintained by Rumford and others. Leslie<sup>1</sup> appears, in a great part of his *Inquiry*, to be a supporter of some undulatory doctrine, but it is extremely difficult to make out what his undulating medium is; or rather, his opinions wavered during his progress. In page 31, he asks, "What is this calorific and frigorific fluid?" and after keeping the reader in suspense for a moment, he replies,

"Quod petis hic est.

It is merely the ambient AIR." But at page 150, he again asks the question, and, at page 188, he answers, "It is the same subtile matter that, according to its different modes of existence, constitutes either heat or light." A person thus vacillating between two opinions, one of which is palpably false, and the other laden with exceeding difficulties which he does not even attempt to remove, had little right to protest against<sup>2</sup> "the sportive freaks of some intangible *aura*;" to rank all other hypotheses than his own with the "occult qualities of the schools;" and to class the "prejudices" of his opponents with the tenets of those who maintained the *fuga vacui* in opposition to Torricelli. It is worth while noticing this kind of rhetoric, in order to observe, that it may be used just as easily on the wrong side as on the right.

Till recently, the theory of material heat, and of its propagation by emission, was probably the one most in favor with those who had studied mathematical thermotics. As we have said, the laws of con-

<sup>1</sup> *An Experimental Inquiry into the Nature and Propagation of Heat*, 1804.

<sup>2</sup> *Ib.* p. 47.