

offer some difficulty. It appeared that cold was reflected no less than heat. A mass of ice, when its effect was concentrated on a thermometer by a system of mirrors, made the thermometer fall, just as a vessel of hot water placed in a similar situation made it rise. Was cold, then, to be supposed a real substance, no less than heat?

The solution of this and similar difficulties was given by Pierre Prevost, professor at Geneva, whose theory of radiant heat was proposed about 1790. According to this theory, heat, or *caloric*, is constantly radiating from every point of the surface of all bodies in straight lines; and it radiates the more copiously, the greater is the quantity of heat which the body contains. Hence a constant exchange of heat is going on among neighboring bodies; and a body grows hotter or colder, according as it receives more caloric than it emits, or the contrary. And thus a body is cooled by rectilinear rays from a cold body, because along these paths it sends rays of heat in greater abundance than those which return the same way. This *theory of exchanges* is simple and satisfactory, and was soon generally adopted; but we must consider it rather as the simplest mode of expressing the dependence of the communication of heat on the excess of temperature, than as a proposition of which the physical truth is clearly established.

A number of curious researches on the effect of the different kinds of surface of the heating and of the heated body, were made by Leslie and others. On these I shall not dwell; only observing that the relative amount of this radiative and receptive energy may be expressed by numbers, for each kind of surface; and that we shall have occasion to speak of it under the term *exterior conductivity*; it is thus distinguished from *interior conductivity*, which is the relative rate at which heat is conducted in the interior of bodies.⁶

Sect. 3.—Verifications of the Doctrines of Conduction and Radiation.

THE interior and exterior conductivity of bodies are numbers, which enter as elements, or *coefficients*, into the mathematical calculations founded on the doctrines of conduction and radiation. These coeffi-

⁶ The term employed by Fourier, *conductibility* or *conducibility*, suggests expressions altogether absurd, as if the bodies could be called *conductible*, or *conducibile*, with respect to heat: I have therefore ventured upon a slight alteration of the word, and have used the abstract term which analogy would suggest, if we suppose bodies to be *conductive* in this respect.