

portion of it on which the difference of the seasons depends.

(353.) The principal effects of heat are the sensations of warmth or cold consequent on its entry or egress into or out of our bodies; the dilatation it causes in the dimensions of all substances in which it is accumulated; the changes of state it produces in the melting of solids, and the conversion of them and of liquids into vapor; and the chemical changes it performs by actual decompositions effected in the intimate molecules of various substances, especially those of which vegetables and animals are composed; to which we may add, the production of electric phenomena under certain circumstances in the contact of metals, and the developement of electric polarity in crystallized substances.

(354.) Cold has been considered by some as a positive quality, the effect of a cause antagonist to that of heat; but this idea seems now (with perhaps a single exception) to be universally abandoned. The sensation of cold is as easily explicable by the passage of heat outwards through the surface of the body as that of heat by its ingress from without; and the experiments cited in proof of a radiation of cold are all perfectly explained by Prevost's theory of reciprocal interchange. It is remarkable, however, how very limited our means of producing intense cold are, compared with those we possess of effecting the accumulation of heat in bodies. This is one of the strongest arguments adducible in favor of the doctrines of those who maintain the possibility of exhausting the heat of a body altogether, and leaving it in a state absolutely devoid of it. But we ought to consider, that the known methods of generating heat chiefly turn on the production of chemical combinations; we may easily conceive, therefore, that, to obtain equally powerful corresponding frigorific effects, we ought to possess the means of effecting a disunion equally extensive and rapid between such elements, actually combined, as have already produced heat by their union. This, however, we can only accomplish by engaging them in com-