weights or equal bulks of *similar* substances varying in temperature be mixed together, the heat of the resulting substance will be the arithmetical mean of the temperatures of the substances mixed; but, if the substances employed *differ* in their nature, the result will be different. If, for instance, two equal portions of water, one standing at 60, the other at 40 degrees Fahrenheit, be mixed together, the temperature of the mixture will be the mean, or 50 degrees; but, if one pound of mercury at 160 degrees be mixed with a pound of water at 40 degrees, the mixture will exhibit a temperature of 45; so that the 115 degrees lost by the former, increase the heat of the latter by 5 degrees only. Again, to convert any given quantity of water at 212 degs. into steam at 212 degs. an amount of heat is required sufficient to raise the temperature of the water, did it remain in the liquid form, 950 degrees; and in the reduction of vapour at 212 degrees to water at 212, the 950 degrees employed in its production are given out again. On facts such as these was based the theory of latent heat. All the phenomena, however, are quite as explicable by the "cor-relation" doctrine, as by that view which imposes on us the necessity of admitting the unmanifested existence in matter of something whose presence is known to us only through its manifestations. In the vaporization of water, according to the "cor-relation theory," there is a conversion of heat into mechanical force; and conversely, in the reduction of steam to a fluid condition, the mechanical force is changed into heat. The disappearance of caloric when heated mercury and water are mixed together, may be accounted for by the generation of mechanical force, and possibly by the excitation likewise of electricity and chemical affinity. In the phenomena of the conversion of a solid into a liquid, and a liquid into an æriform body, a change produced by the separation of the particles of matter through the agency of heat, we have ample evidence of the power of force-heat to originate motion.

That heat produces light is a fact so obvious to all, it would be merely superfluous to adduce anything in proof. Indeed, there is so marked an analogy between them, it becomes a question whether they are not different modifications of the same force, rather than two distinct forces cor-relative to each other.

The operation of heat in the excitation of electricity, was first noticed in such minerals as tourmaline and boracite, in which the electrical equilibrium is disturbed by the application of heat; but Prof. Seebeck, of Berlin, discovered, in the year 1821, that when two different metals, as bismuth and antimony—platina and iron, or copper and mercury, are soldered together, and heat applied at the point of junction, a current of electricity is immediately developed. Prof. Cumming, of Cambridge,