

remained a constant quantity; that is to say, if at any point in its flight we measure the energy of position it has acquired we shall find that the sum of the two is equal to the energy of motion when the ball was moving at its highest velocity. When it has reached its extreme limit, the ball still possesses the same power to do work that it had the moment it left the muzzle of the gun. In its downward flight, at the moment it begins to descend, it also begins to give up its energy of position and to take on to the same degree energy of motion.

Energy of motion increases while energy of position decreases in its downward movement until it has reached a point on a level with the muzzle of the gun, when it has given up all of its energy of position and has been changed to that of motion. Suppose it strikes a solid substance in its fall, it will do this with the same energy that the ball had when it issued from the muzzle of the gun. Here another transmutation takes place, for the sudden arrest of the movement of the ball has converted what was before mechanical energy into molecular energy—in the form of heat. It is still moving energy, but no longer a movement of the mass, which is called mechanical or visible, but it is represented by an increased movement of the ultimate particles of the mass, which we call molecular energy.