

to the ground. If the plate had not been placed in the track of the cannon-ball, its flight upward may have been a mile, or several miles, but all of this wonderful power has been spent in simply piercing the plate; where has its energy gone, if the law of conservation is true, as we have stated? All that is visible to the eye is a hole in the armor-plate, and the ball—which has only been able to simply pass through it at an elevation of 100 feet and then fall to the ground, where it lies an inert mass. What has become of its energy? We will try to answer this question.

The firing of the shot was the result of a sudden release of potential energy that was stored in the substances of which the powder was composed. An application of heat to the powder set in action the chemical process called combustion, which suddenly caused a large portion of the powder to assume the gaseous form, when it immediately tends to occupy a space many hundreds of times greater than the powder did. This sudden expansion drives the shot from the gun with an energy that is measurable, and, as we have seen in the case supposed, sufficient to pierce a heavy armor-plate. This tremendous energy that a moment ago exhibited itself in the form of visible motion has not been destroyed, as appearances would indicate. All of it has