

position is called potential energy. Thus the weight *at rest* upon the table possesses potential energy, but as it falls, as soon as it begins to move, this is changed into kinetic energy. It is somewhat similar to the man who is skilled in surgery, he is called a surgeon whether he be in actual practice or not—he is as much a surgeon before the limb is amputated as while engaged in the amputation, for he possesses all the powers and capabilities for doing the work when the circumstances require.

Energy is visible in the universe under various forms, but they may all be reduced, as far as known, to eight heads, though scientific research may any day simplify them or add some additional forms. Let us briefly enumerate them.

1st. We have visible energy of actual motion, which is observed in everything that moves. The storm, the stream, the moving vessel, the train, the cannon ball, the movements of animals, are common examples.

2nd. Visible energy of position, as examples of which we may mention the rain cloud, a stone placed on the top of a hill, or a head of water from which the miller can draw as he desires.

These two forms of energy belong to the visible world; for the remainder of our energies we must go to the molecular world, and instead of dealing with things visible we must consider the different forms of energy possessed by molecules and atoms.

The third form of energy that we will mention is one that we have already touched upon, and called radiant energy—the energy of the rays of heat and light. If we allow the rays to fall upon a body, a gas for instance, two operations seem to be performed: the molecules are pushed or caused to move farther apart and thereby do work, and manifest—

4th. The energy of molecular separation. The value of this energy is observable in the steam engine, where the molecules of steam separating with such mighty force push forward the piston rod and thereby propel the train. But some of the heat that is absorbed disappears in some manner not observable in the expansion or heating of the gas, being employed in giving