

## CHAPTER IV.

### TRANSMUTATION OF ENERGY.

It will be seen from the foregoing chapters that the energy of the universe exists in various guises, which we call the "forces of nature."

We have visible energy of motion, as seen in the flow of water, the movement of the heavenly bodies and the firing of a shot. We have visible energy of position, as seen in a reservoir of water elevated above sea-level, or in a weight that has been carried to some position above the surface of the earth. We have energy of position in molecular separation and in atomic or chemical separation. Also there is moving energy in the form of heat motion, the motion of an electric current and that of radiant energy. These are some of the forms of energy existing, and so far as the universe is concerned the sum of them remains a constant quantity. They are not really different energies, but the same energy appearing under different guises.

It will be seen that all work performed must come from energy of position. The tendency