

## CHAPTER V.

### HEARING.

#### § 1. *Acoustic Principles.*

THE knowledge acquired by animals of the presence and movements of distant objects is derived almost wholly from the senses of hearing and of sight; and the apparatus, necessary for the exercise of these senses, being more elaborate and refined than any of the organs we have yet examined, exhibit still more irrefragable evidence of those profound designs, and that infinite intelligence, which have guided the construction of every part of the animal frame.

Sound results from certain tremulous or vibratory motions of the particles of an elastic medium, such as air or water, excited by any sudden impulse or concussion given to those particles by the movements of the sounding body. These sonorous vibrations are transmitted with great velocity through those fluids, till they strike upon the external ear; and, then, after being concentrated in the internal passages of the organ, they are made to act on the filaments of a particular nerve called the *acoustic*, or *auditory* nerve, of which the structure is adapted to receive these peculiar impressions, and to communicate them to the brain, where they produce changes, which are immediately followed by the sensation of sound. Sound cannot traverse a void space, as light does; but always requires a ponderable material vehicle for its transmission; and, accordingly, a bell suspended in the vacuum of an air-pump, gives, when struck, no audi-