

obvious motions, are due to the influence of light, heat, moisture, cold, and similar external agents; but all the motions peculiar to animals are produced by a cause residing within themselves, namely, the *contractility* of muscular fibres.

151. The cause which excites contractility resides in the nerves, although its nature is not precisely understood.

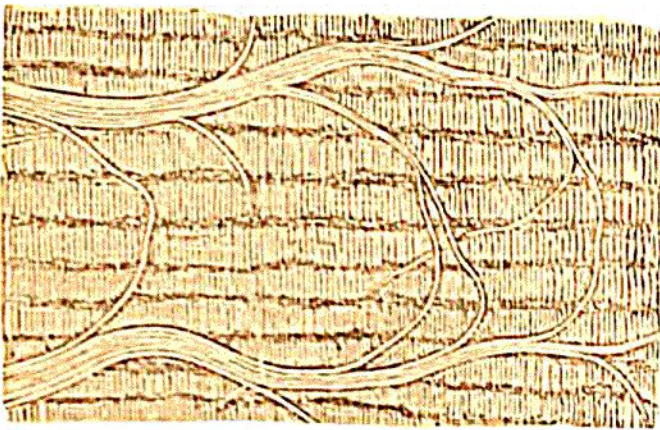


Fig. 25.

We only know that each muscular bundle receives one or more nerves, whose filaments pass at intervals across the muscular fibres, as seen in Fig. 25. It has also been shown, by experiment, that when a nerve entering a muscle is severed, the muscle instantly loses its power of contracting under the stimulus of the will, or, in other words, is paralyzed.

152. The muscles may be classified, according as they are more or less under the control of the will. The contractions of some of them are entirely dependent on the will, as in the muscles of the limbs used for locomotion. Others are quite independent of it, like the contractions of the heart and stomach. The muscles of respiration ordinarily act independently of the will, but are partially subject to it: thus, when we attempt to hold the breath, we arrest, for the moment, the action of the diaphragm.

153. In the great majority of animals, motion is greatly aided by the presence of solid parts, of a bony or horny structure, which either serve as firm attachments to the muscles, or, being arranged so as to act as levers, to increase the precision and sometimes the force of movements. The solid parts are usually so arranged as to form a sub-

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