

tery in motion, he exclaimed:—"Voilà, docterr, l'image de la vie; la colonne vertébral est le pole, la vessie le pole positif, et la foie le pole negatif." Numerous careful experiments, however, instituted by Muller, Matteucci, Todd and Bowman, and others, satisfactorily substantiate that no current of electricity can be detected passing along a nerve by the galvanometer while nervous force is being manifested in the production of muscular contraction. If a ligature be placed on a nerve, its power of conducting nervous force beyond the point of application is destroyed; but electricity passes on without interruption. If a portion of a nerve be removed, and the two parts connected by a conductor of electricity, nervous force generated above the section will not pass through the conductor to parts below; whilst electricity is readily transmitted by the conductor from one portion of the nerve to the other. The nerve fibre is not so good a conductor of electricity as the muscular fibre, and is far inferior in that respect to the metals. These facts are abundantly sufficient to establish the non-identity of the two forces. Nervous force, nevertheless, is capable of originating electricity. The electric fishes, as the *Torpedo* and the *Gymnotus Electricus* or electrical eel, are remarkable instances. In the *Torpedo*, the electric organs are largely supplied by branches of the pneumogastric nerve, a nerve which, curiously enough, has a more extensive distribution in man than any other of the cranial or spinal nerves. Those of the *Gymnotus* are supplied by 224 parts of intercostal nerves, derived from the spinal chord. That a connection with the brain is absolutely necessary to the generation of electricity in the organs apparently more immediately concerned in such generation, is evident from the following:—If all the nerves going to the electric organ be divided, no manifestation of electricity will take place. If the nerves leading to one side of the organ be cut, it ceases to develop electricity; but the other portion, which still retains its connection with the nervous system intact acts perfectly; and, if a portion of the organ be removed, the remaining portion continues to discharge electricity. A current of electricity cannot be detected passing along the nervous chord while the organs are actively developing and discharging electricity.

Electricity, on the other hand, develops nervous force. Independently of the excitation of nervous energy in the nerves of *common sensation and motion*, it calls into action the peculiar function of each nerve of *special sense*. Thus, if a galvanic current be passed through the retina, a vivid flash of light is immediately perceived. Ritter found that when it is passed through the auditory nerve, a distinct sound is produced; and the same observer remarked that when it is applied to the filaments of the olfactory, an ammoniacal smell is excited by the negative pole, and an