

received some very violent shocks. Had we placed a very delicate electroscope in the contiguous strata of water, it might possibly have been influenced at the moment when the gymnotus seemed to direct its stroke elsewhere. Prepared frogs, placed immediately on the body of a torpedo, experience, according to Galvani, a strong contraction at every discharge of the fish.

The electrical organ of the gymnoti acts only under the immediate influence of the brain and the heart. On cutting a very vigorous fish through the middle of the body, the fore part alone gave shocks. These are equally strong in whatever part of the body the fish is touched; it is most disposed, however, to emit them when the pectoral fin, the electrical organ, the lips, the eyes, or the gills, are pinched. Sometimes the animal struggles violently with a person holding it by the tail, without communicating the least shock. Nor did I feel any when I made a slight incision near the pectoral fin of the fish, and galvanized the wound by the contact of two pieces of zinc and silver. The gymnotus bent itself convulsively, and raised its head out of the water, as if terrified by a sensation altogether new; but I felt no vibration in the hands which held the two metals. The most violent muscular movements are not always accompanied by electric discharges.

The action of the fish on the human organs is transmitted and intercepted by the same bodies that transmit and intercept the electrical current of a conductor charged by a Leyden jar, or Voltaic battery. Some anomalies, which we thought we observed, are easily explained, when we recollect that even metals (as is proved from their ignition when exposed to the action of the battery) present a slight obstacle to the passage of electricity; and that a bad conductor annihilates the effect, on our organs, of a feeble electric charge, whilst it transmits to us the effect of a very strong one. The repulsive force which zinc and silver exercise together being far superior to that of gold and silver, I have found that when a frog, prepared and armed with silver, is galvanized under water, the conducting arc of zinc produces contraction as soon as one of its extremities approaches the muscles within three lines distance; while an arc of gold does not excite the organs, when the