

it be capable of directing the action of its organs to an external object. We often tried, both insulated and otherwise, to touch the fish, without feeling the least shock. When M. Bonpland held it by the head, or by the middle of the body, while I held it by the tail, and, standing on the moist ground, did not take each other's hand, one of us received shocks, which the other did not feel. It depends upon the gymnotus to direct its action towards the point where it finds itself most strongly irritated. The discharge is then made at one point only, and not at the neighbouring points. If two persons touch the belly of the fish with their fingers, at an inch distance, and press it simultaneously, sometimes one, sometimes the other, will receive the shock. In the same manner, when one insulated person holds the tail of a vigorous gymnotus, and another pinches the gills or pectoral fin, it is often the first only by whom the shock is received. It did not appear to us that these differences could be attributed to the dryness or moisture of our hands, or to their unequal conducting power. The gymnotus seemed to direct its strokes sometimes from the whole surface of its body, sometimes from one point only. This effect indicates less a partial discharge of the organ composed of an innumerable quantity of layers, than the faculty which the animal possesses, (perhaps by the instantaneous secretion of a fluid spread through the cellular membrane,) of establishing the communication between its organs and the skin only, in a very limited space.

Nothing proves more strongly the faculty, which the gymnotus possesses, of darting and directing its stroke at will, than the observations made at Philadelphia and Stockholm,* on gymnoti rendered extremely tame. When

* By MM. Williamson and Fahlberg. The following account is given by the latter gentleman. "The gymnotus sent from Surinam to M. Nörderling, at Stockholm, lived more than four months in a state of perfect health. It was twenty-seven inches long; and the shocks it gave were so violent, especially in the open air, that I found scarcely any means of protecting myself by non-conductors, in transporting the fish from one place to another. Its stomach being very small, it ate little at a time, but fed often. It approached living fish, first sending them from afar a shock, the energy of which was proportionate to the size of the prey. The gymnotus seldom failed in its aim; one single stroke was almost always sufficient to overcome the resistance which the strata