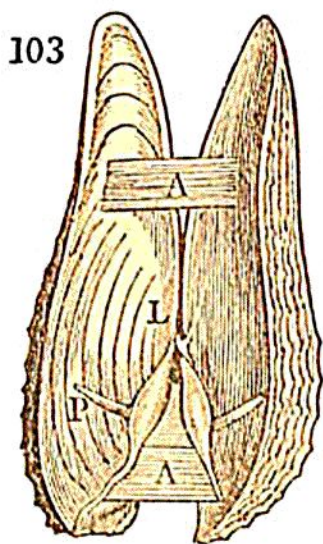


mize muscular power, whenever a substitute could be had, and such a substitute she has here provided, by uniting with the muscle an elastic ligament, of a peculiar construction. It has a texture similar to that of the *ligamentum nuchæ*, and being placed on the side of the muscle next to the hinge, allows the valves to separate to the proper distance only.\* When the animal dies, the muscular force ceases, but the ligament with which the muscle is associated, retaining its elasticity, allows the shell to open, but only to a certain extent; and, accordingly, this is the state in which we find bivalve shells that are cast upon the shore, after the soft flesh of the animal has decayed and been washed out, provided the cartilage and the ligament of the hinge are still preserved.†

The simple actions of opening and closing the valves are capable of being converted into a means of retreating from



danger, or of removing to a more commodious situation, in the case of those bivalves which are not actually attached to rocks or other fixed bodies. Diquemare long ago observed that even the oyster has some power of locomotion, by suddenly closing its shell, and thereby expelling the contained water, with a degree of force, which, by the reaction of the fluid in the opposite direction, gives a sensible impulse to the heavy mass.

\* This remarkable structure was first described by Dr. Leach, in a paper read before the Royal Academy of Paris. *Bulletin des Sciences*, 1818, p. 14. See also Gray, in *Zoological Journal*, I. 219.

† The *Pholas* is an exception to this rule; for instead of its valves being united, as usual, by an elastic ligament, they are connected chiefly by means of muscles. This departure from the ordinary structure is probably occasioned by a new condition introduced into the economy of the animal in consequence of its being fitted for excavating passages through hard rocks. It is furnished, for this purpose, with a complicated boring apparatus moved by many muscles, and requiring great freedom of action. Fig. 103 represents the shell of the *Pholas candida* extremely expanded, in order to show the hinge, together with the ligament, L; the long and thin process of shell, r, to the ends of which, on each side, a pair of fan-shaped muscles, more particularly employed in boring, are attached; and the two adductor muscles,