

## SECTION XVIII.

## SUB-ORDERS OF TESTUDINATA.

*The Sub-Order of Sea-Turtles*—CHELONI, Opp.<sup>1</sup> The sea is the home of these animals. They swim freely, and sustain themselves in the water for any length of time without seeking the bottom or the shore for support or rest. They never go on land, except to lay their eggs, and then proceed only a short distance from the shore, moving slowly and in a very constrained way. They swim almost entirely by means of the front limbs; the other pair act independently, and are chiefly useful in aiding to balance the body and guide the general course. The forearm and hand form a sort of paddle, or rather a wing. These two wings are raised together, and also strike downward simultaneously; but the blow is not exactly vertical, the wings being carried forward as they rise, and approaching the breast when brought down. They descend farther below the body than they rise above it, and their motion is very similar to that of a Bird's wings; indeed, the animal may be said to fly through the water. On land, these animals still move the front limbs together, carrying them forward, throwing the weight of the body upon the elbows or thereabouts, and then pulling the whole toward them.

The peculiar flying locomotion of this sub-order affects the general symmetry of the body very essentially in two ways: first, it makes it necessary that the bulk of the body should be carried forward near the wings, otherwise the animal could not control it; secondly, the force necessary to propel the wings requires a large muscular apparatus, and this takes much room, so that the fore part of the body (dividing the whole crosswise into two parts of equal lengths) far outweighs the hind part, being in bulk in the proportion of two to one; the fore part is broad and high, the hind part descending and narrowing gradually. The humerus is very short, and the extensive surface of the wing arises principally from the blade, which is formed of the forearm and hand. This blade is long, broad, and thick at the base, thin along the inner margin, and pointed at the outer end; it is turned back at the elbow, and cannot be brought out in a line with the humerus, though it is capable of moving towards it and away from it through a long arc. The force and general direction of the blow is given by the muscles of the shoulder; but the surface presented is determined in a great measure by the rotation at the elbow, at the wrist, and within the hand, the blade being

<sup>1</sup> This sub-order was first recognized and characterized by Oppel, in the work quoted below, p.

309. Compare also Sect. 2, p. 241, where the synonyms of the sub-orders are given, and PL I-VI.