

webbed surface is presented to the water, and when the foot is withdrawn for another blow, the web is folded;—a very different way of controlling the surface presented to the resistance of the water from the turning of a stiff blade, now edgewise, now flatwise, which takes place with the sea Turtles. The limbs, thus jointed and proportioned, can always be withdrawn under the carapace, the front pair before, and the hind pair behind, the main bulk of the body; the neck is always retractile enough to allow the head to be withdrawn partially, and generally completely, within the shield; and we nowhere find the temporal muscles protected by such a very broad bony arch as exists in the sea Turtles.

Here, then, those features which are most peculiarly characteristic of the order of Turtles, namely, the protection of the body by the shield, and the withdrawing into the shield of the head and neck, and limbs and tail, are most fully developed. This sub-order occupies clearly a higher rank than the other; the equilibrium of the body, the higher development of the limbs, the coöperation of both pairs in the progression, the greater specialization of the neck vertebræ allowing the head to be withdrawn under the carapace, the nature of the habitat, and the higher degree to which the characters of the order are carried,—all these features assign to the Amydæ a rank superior to that of the sea Turtles. In this higher group, the Bird characters, which are so prominent in the sea Turtles, yield to the characters of a higher class. The equal development of the two pairs of limbs, their full coöperation, the walking locomotion, the elevation of the body free from the ground while walking which takes place with most of them, and the general symmetry of the body, are characters which remind us of the class of Mammals. And the analogy is the more striking when we remember that this is the first instance, in the series of Vertebrata, of real walking, unless the running of some toads be considered as such; for the Salamanders, the Lizards, and the Crocodiles move partly by means of the vertebral column bending and carrying the legs forward, now on one side and now on the other. These Mammalian characters may be not so striking here as the Bird characters are with the other group, for the class of Reptiles is further removed from that of Mammals than the Birds; still the analogy is too complete and too clear to be accidental, or to be passed over in silence. One marked difference between the locomotion of these Turtles and that of Mammals is, that in the former the knee and elbow joints open in the same direction, whereas in Mammals they bend in directions opposite to one another.

The characters of the Chelonii and Amydæ show these two groups to be sub-orders, and neither families nor orders proper, as they partake of the features of orders, without extending to the whole structure of all the different systems of their organization.